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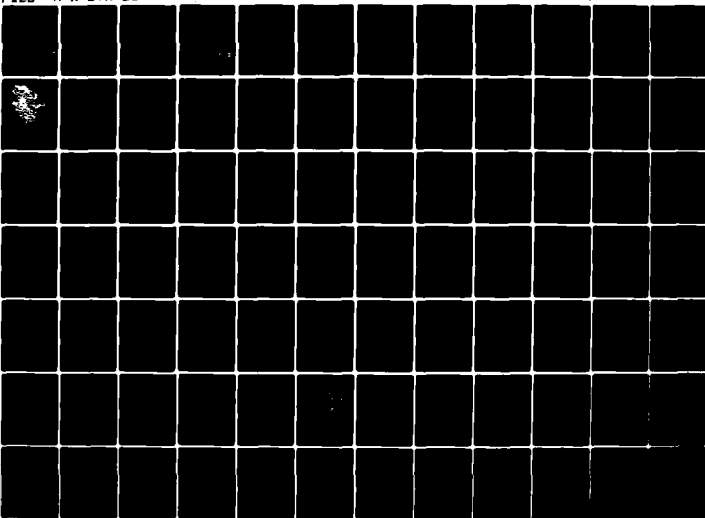
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19) REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM	
1. REPORT NUMBER AFSCTR-81-36	2. GOVT ACCESSION NO. AD-A093794	3. RECIPIENT'S CATALOG NUMBER	
4. TITLE (and Subtitle) Environmental Technical Report, Environmental Characteristics of Alternative Designated Deployment Areas, Native Americans (Nevada/Utah).		5. TYPE OF REPORT & PERIOD COVERED Final Report.	
7. AUTHOR(s)		6. PERFORMING ORG. REPORT NUMBER MX ETR 21	
(14) M-X-ETR-22 (15)		8. CONTRACT OR GRANT NUMBER(s) F04704-78-C-0029	
9. PERFORMING ORGANIZATION NAME AND ADDRESS Henningson, Durham and Richardson Santa Barbara, CA 93010		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 64312F	
11. CONTROLLING OFFICE NAME AND ADDRESS Ballistic Missile Office Norton AFB CA (13) 203/		12. REPORT DATE 22 December 1980	
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		13. NUMBER OF PAGES 206	
		15. SECURITY CLASS. (of this report) Unclassified	
16. DISTRIBUTION STATEMENT (of this Report) Unclassified/Unlimited		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE	
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)			
18. SUPPLEMENTARY NOTES			
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) MX Siting Analysis Environmental Report Indians Nevada Utah			
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The potential impacts from M-X deployment on Native Americans in Nevada/Utah will extend beyond the immediate vicinity of construction to those who are concerned with this particular region, in terms of culture, society, and economy. This study, therefore, is not restricted to Native Americans immediately adjacent to proposed M-X sites. Instead, it extends, to all Nevada/Utah Native Americans with historic and contemporary concerns in the region.			

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APPENDIX - 1

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ENVIRONMENTAL CHARACTERISTICS OF
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AREAS: NATIVE AMERICANS
(NEVADA/UTAH)

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Prepared For

U.S. Air Force
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Norton Air Force Base
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1.0 INTRODUCTION

1.1 LEGAL BACKGROUND

Under 42 U.S.C.A. 4331(4) National Environmental Policy Act (NEPA) it is the responsibility of the federal government "to use all practicable means, consistent with other considerations of national policy "... so that the nation may..." preserve important historic, cultural and natural heritage, and maintain whenever possible an environment which supports diversity and variety of individual choice."

Native Americans have a special role in the NEPA process, a role recognized in implementing regulations that require agencies to give "notice to federally recognized Indian tribes when effects may occur on reservations." This notice to the Indian tribes (40 CFR sec. 1506.6) is part of the decisionmaking process in which an affected Indian tribe is invited to participate (40 CFR 1507.7(a)(1)). The effects or impacts on an Indian tribe include both benefits and detriments (40 CFR 1508.8(b)).

Five broad categories of Native American input to the NEPA process are as follows:

1. Reservation Lands. There are three types of Indian reservations: those created by treaties prior to 1871, those created by Acts of Congress since 1871, and those made by an executive order that public lands be set apart for the use by the Indians.

Nineteenth century federal policy was to isolate the Native Americans on reservations. McClanahan v. Arizona State Tax Commission; 411 U.S. 164, 174 (1973). Towards the end of the century, Congress changed federal Indian policy from one of isolation to one of assimilation. (24 Stat. 388, (1887) (codified at 25 U.S.C. A sec. 331, 334, 348, 349, 381).

Nearly 50 years later, Congress retreated from the policy of assimilation. Undistributed reservation lands were returned to trust status and tribal self government was encouraged under the Indian Reorganization Act of 1934 Pub. L. 73-383, Ch. 576, 48 Stat 984 (1934) codified in 25 U.S.C.A sec. 461 and following (1976).

A federally recognized Indian tribe possesses all the powers of a sovereign state, unless these powers are limited by treaties and acts of Congress. U.S. v. Jackson, 600 F2d 1283 (C.A. Or. 1979) and U.S. Const. art. I sec. 8 Cl. 3. The United States generally holds the fee title in trust, and the right of use and occupancy is possessed by the Indians. See Federal Indian Law p. 601 (Assoc. of Am. Ind. Affairs, 1966) and U.S. v. State of Michigan, 471, Fed. Supp. 192 (D.C. Mich. 1979).

An EIS is required when an agency proposes to lease Indian lands. Davis v. Morton, 469 F2d 593, 597-598 (10 Cir. 1972). A lease of reservation lands requires the approval of the Secretary of the Interior, but he may not grant the lease on his own authority. Pofpybitty v. Skelly Oil Co. 390 U.S. 365 (1968). Leases of Indian lands are governed by 25 CFR 131.1 to 131.20 (1980). Such a grant of a right of way would not violate the federal government's trust responsibility. Under a certificate of interest, however, the tribal entity without the consent of the person occupying the land, could grant a highway right of way through an Indian reservation. Hunger v. Andrus, 476 Fed Supp. 357 (S.D. 1979). If the right of way is granted from lands

held in trust for the Indians, the Indians are entitled to just compensation. U.S. v. So. Pac. Trans. Co., 543 F2d 676 (C.A. Nev 1976). Rights of way over Indian lands are governed by 25 CFR 161.1 to 161.28 (1980).

2. Indian Water Rights to Irrigate Reservation Land. The date the reservation was set aside for Indian use by either treaty, Act of Congress, or executive order determines the priority of Indian water rights.

When land is set aside for Indian use, there is an implied right to retain sufficient water to meet the purposes of the Indian reservation. Winters v. United States, 207 U.S. 564 (1908). In Cappaert v. United States, 426 U.S. 128, (1976) the Supreme Court held that the reservation of water to meet the purposes of a federal reservation extended to groundwater since "groundwater and surface water are physically interrelated as integral parts of the hydrological cycle..." Currently the Papago Indians are engaged in litigation with the City of Tucson to establish rights to reservation groundwater. "Winters, gives the Indians a reserved right to the water, but not the absolute right to determine the source...the state may apportion... water (water which is not reserved for or used by the Indians) among non-Indians" but, "State created water rights are junior to, and therefore not in competition with the Indians' rights." Colville Confederated Tribes v. Boyd Walton, Jr. 80 Daily Journal DAR 2440 (Aug. 20 1980). Under 25 USCA Sec. 622 the Secretary of Interior (with the consent of the tribal authorities), may exchange water rights. Tribal consent, however, is not a prerequisite to congressional action regarding the operation of a water reservoir underlying tribal lands. LAC Courte Oreilles Band of Lake Superior Chippewa Indians v. Federal Power Commission, 510 F2d 198 (1975). "The Tribe must recognize the validity of state created rights in surplus water California Oregon Power Co. v. Beaver Portland Cement Co., 295 U.S. 142, 162 (1935) (water severed from public lands and available for appropriation absent prior federal reservation). Its regulatory authority over apportionment encompasses only reserved water and, even there, it can oust state-created rights only by actual use." Colville Confederated Tribes v. Boyd Walton, Jr. 80 Daily Journal DAR 2440. Since the United States Supreme Court decided Colorado River Water Conservation District v. United States, 424 U.S. 800 (1976), the state courts are the primary forum for adjudicating all water rights within state boundaries, including rights claimed by the federal government as trustee for Native American lands withdrawn by treaty or other governmental action.

3. National Historic Preservation Law and Implementing Guidelines. When dealing with antiquities, the Native American's power to influence the decisionmakers is particularly potent.

Under 36 CFR sec. 800.15 federally recognized tribes are encouraged to participate in the review process "in evaluating National Register and eligible properties determining effect and developing alternatives to avoid or mitigate an adverse effect." Executive Order 11593, directs all land-holding agencies in the federal government to identify and nominate historic properties for the National Register. The order places an affirmative duty of care on all federal agencies managing properties that might be eligible for the National Register. Section 3(a) and 7(a) of the Archaeological and Historic Preservation Act of 1974 establish two options for an agency to use to preserve these properties: (1) the agency may perform the required work or (2) the agency may request the Secretary of the Interior to perform the work using a fund transfer of up to one percent of the total cost of the project. (16

U.S.C.A. 469 (c)). The Heritage Conservation and Recreation Service will ordinarily not use funds for preservation of resources until the agency informs HCRS that it has complied with NEPA, the National Historic Preservation Act and Executive Order 11593 (Fed. Regis. Vol. 44 No. 59 26 Mar 1979).

It should be noted, for purposes of analysis, that if an historic or ancient site meets the standards for inclusion in the National Register, any change in the site must be considered by using the "adverse affect" criteria of 36 CFR 800.3. An undertaking concerning the site is considered to have an "effect" when it may cause any change, either beneficial or adverse, in the quality that causes the property to meet the criteria for inclusion in the National Register (40 CFR 800.3). (See requirements for a Programmatic Memorandum of Agreement which should be included in the final environmental impact statement.)

4. Protection and Preservation of American Indian Religious Freedom. Under 42 U.S.C.A. sec. 1996, it is the policy of the United States to protect and preserve for American Indians their religious freedom. Freedom of worship includes, but is not limited to, access to sites and possession of sacred objects. Several agencies have revised their guidelines to comply with the intent of the law.

It is clear that the Religious Freedom Act would protect a Native American's use of peyote in a bonafide pursuit of a religious faith. People v. Woody, 61 Cal. 2d 716 (1964) and Golden Eagle v. Johnson, 493 F.2d 1179 (1974).

The personal freedom to express one's native religion, however, is outweighed by a contravening policy to assure survival of an endangered species. A Native American's desire to use eagle feathers in a religious ceremony must yield to Congressional policy expressed in the Eagle Protection Act. United States v. Fryberg, 622 F2d 1010 (1980).

5. Employment and Community Well-Being.

Employment and general community well being are part of the social and economic factors that make up part of the Native American's "human environment." " When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all these effects on the human environment." 40 CFR 1508.14. Under NEPA, we may perceive a continual broadening of the sphere of recognized and secured interests. The law is an attempt to reconcile, to harmonize, and to compromise conflicting interests.

Early cases under NEPA dismissed social problems as inapplicable to the human environment. Image of Greater San Antonio v. Brown, 11 ERC 1529 (CA 5th 1978) and Breckenridge v. Rumsfeld, 11 ERC 1529 (CA 6th, 1976). Contra McDowell v. Schlesinger, 404 F. Supp. 221 (W.D. Mo. 1975).

More recent cases have held that allegations of economic injury with an ecological injury were sufficient grounds to sue in a federal court. Shiffler v. Schlesinger, 548 F 2d 96 (3d Cir. 1979) and Lake Erie Alliance v. Corp. of Engineers 14 ERC 1405, 1407 (1980).

The modern court now considers that the cumulative effects of the project and the socioeconomic impacts are important considerations in an environmental impact statement. Manygoats v. Kleppe 558 F. 2d 556 (1977).

As any line of adjustment between conflicting rights must be drawn on practical grounds, there is no doubt that these rights may vary under different circumstances. For example, it has been established under an Alaska State Statute that it is unlawful for anyone to hunt walrus. Nevertheless, federal authorities have a trust responsibility toward Indians, "including the duties so as to protect the subsistence resources of Indian communities (cases cited) and to preserve such communities as distinct cultural entities against interference by the states." People v. Togiak, 470 F. Supp. 423 (1979). In the Togiak case an Alaskan native's right to hunt walrus was upheld against the Alaskan statute prohibiting such hunting.

Logic, history, custom, utility and community standards of right conduct shape the progress of the law. (Cardoza, 1921). The coordination of competing interests is tempered in the crucible of the law. This situation may result in recognizing the special position of Native Americans in some areas of concern. For example, it is permissible to grant a monopoly to a Native American under some circumstances. "The education of the public in the history and tradition of the area as well as the promotion of Indian arts and crafts are sufficient grounds to support the policy of the state of New Mexico, and the city of Santa Fe in permitting Indians to sell handcrafted jewelry, arts, and crafts, and prohibiting non-Indians from selling such items in certain areas. Livingston v. Ewing, 601 F2d 1110 (1979).

It is also desirable that Native Americans be given certain employment preferences. Preferential hiring of Indians within the Bureau of Indian Affairs. (25 CFR 259.1 to 259.3) does not violate the Equal Opportunity Act. 42 U.S.C.A. 2000e - 16(a). Morton v. Mancari, 417 U.S. 535 (1974).

The social interests served by protecting Native American autonomy, however, must also be balanced against the social interests served by equity, fairness, and other elements of social welfare such as the needs of national defense. The needs of national defense, however, must be established early in the case McDowell v. Schlesinger, 40 Fed. Supp. 221 (1975) and Concerned About Trident v. Schlesinger, 8 ERC 1129, (1975) Trident v. Rumsfeld, 9 ERC 1370 (1976).

NEPA does not require that an agency abdicate its primary responsibility to defend the nation; it does demand that the Native Americans as an environmental factor be accorded consideration in agency decisions. Concerned about Trident v. Schlesinger, 8 ERC 1129, 1149.

1.2 SCOPE OF STUDY

The potential impacts from M-X deployment on Native Americans in Nevada/ Utah will extend beyond the immediate vicinity of construction to those who are

concerned with this particular region, in terms of culture, society, and economy. This study, therefore, is not restricted to Native Americans immediately adjacent to proposed M-X sites. Instead, it extends, to all Nevada/Utah Native Americans with historic and contemporary concerns in the region.

Three geographical areas or ranges are encompassed in this study: (1) the Great Basin of Nevada/Utah, (2) that portion of the Great Basin which contains hydrologic subunits that have been designated as geotechnically suitable for M-X deployment, and (3) the Designated Deployment Area (DDA), namely the hydrologic subunits that are presently proposed for project construction (see Figure 1.2-1). The largest area under consideration, the Great Basin, is a region of arid elevated enclosed drainages which in aboriginal times was occupied by peoples of closely related languages and cultures. Bands of Washo, Northern Paiute, Shoshone, Southern Paiute, and Ute Indians roamed widely in various portions of this region to exploit seasonal and dispersed resources. Today these peoples are still connected to the Great Basin area through history, a web of kin relations, and traditional subsistence activity and religion. In order to understand the concerns of these Native Americans regarding M-X deployment, it is necessary to investigate their range, economy, religion, culture, and society, both contemporary and historic. This is the primary focus of Section 2.0.

Within the Great Basin geographical unit is a smaller region composed of hydrologic subunits which have been designated as geotechnically suitable for M-X deployment. This region is referred to in this report as the deployment suitability area. A number of these subunits, termed the Dedicated Deployment Area (DDA) are presently proposed for construction activities. Site-specific information on cultural and socioeconomic resources in the deployment area suitability zone are summarized in Section 3.0. An analysis of potential impacts to these resources from the proposed action and project alternatives and of impact significance is found in Section 4.0 of this report. Finally, Section 5.0 considers the potential baseline condition of Native American cultural, physical, and human resources over the next decade in the absence of M-X deployment, particularly in light of other proposed projects and present developmental trends.

1.3 APPROACH AND THEORETICAL FRAMEWORK

The deployment suitability area includes portions of the aboriginal territories of the Northern Paiute, Shoshone, Southern Paiute, and Ute peoples. Linguistic evidence indicates that these closely-related groups have occupied these lands since at least 1000 A.D., and perhaps for millennia. Despite governmental efforts to segregate Nevada/Utah Indians on a small number of geographically isolated reserves in the 19th Century, a significant proportion refused to leave their natal territories. These Native Americans eventually became landless through settler and government appropriations. Several additional reservations and colonies were subsequently created for these groups by the government in their native areas during the 20th Century.

Of central importance and in sharp contrast to the Texas/New Mexico study, area, is that the majority of Nevada/Utah Indians presently occupy lands held by their immediate and distant ancestors. This temporal and spatial continuity has accentuated the cultural and emotional ties of modern Native Americans to their aboriginal territories and to the traditional resources they contain. Despite external

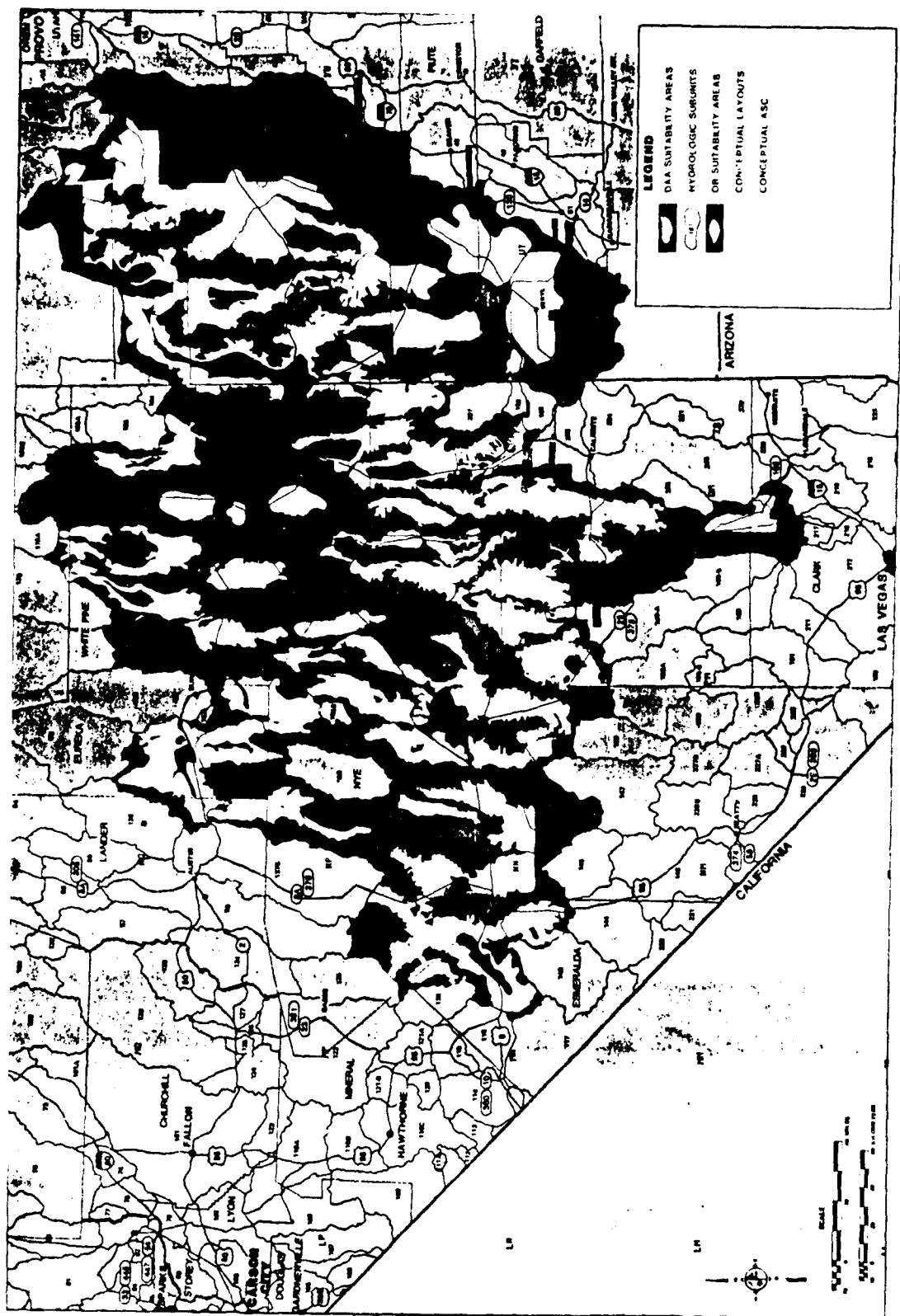


Figure 1.2-1. Designated deployment area of Nevada/Utah.

appearances of assimilation to the American mainstream society, Nevada/Utah reservation Indians maintain a strong identification with their traditional cultures. Native languages have been universally maintained, as have important element of aboriginal customs, religions, and worldviews.

The deployment suitability area contains several populations, such as Native Americans, Mormons, and Basques, which are culturally distinct. An assessment of potential project impacts on the resources and lifeways of these peoples requires a distinct theoretical model and approach. The model must account for the phenomenon of persistence, and additionally provide as framework with which to understand the relative significance of resources to the population, their unique vulnerability to project effects, and the factors which both promote and discourage receptivity to change. The approach for the study of distinct or persistent peoples requires that the population be viewed as the focus rather than a by-product of the larger historical process of inter-group relations and events. That is, the social process in which they emerged and remained as minority groups must be reconstructed from the perspective of persistent peoples themselves. Since histories are typically written from the viewpoint of the majority, the study of persistent peoples often requires consideration of alternate interpretations of chronological events. The purpose of this line of inquiry is not to assume a position of advocacy for one historical reconstruction over another, but to highlight the way in which the persistent minority population views itself in relation to others. This approach provides the necessary perspective or cultural context with which to understand minority issues and concerns regarding change imposed from the outside.

CULTURAL PERSISTENCE THEORY (1.3.1)

Simple assimilationist models have viewed colonized peoples as occupying points on a unidimensional gradient between traditional and modern cultures. Several scholars have recognized the inadequacy of this theory in their studies of certain non-Western populations. Barth (1969), for example, noted that some ethnic groups seek to maintain their distinctiveness by creating behavioral, social, and artificial boundaries between themselves and others. Similarly, Mayer (1971), in his analysis of Black Africans in modern South Africa, underscored the ability of these peoples to participate in the modern industrial economy without any appreciable loss of traditional culture identity. The process by which rural Africans were able to float between two contrastive cultures was termed "encapsulation" by Mayer. That is, Africans adapted to an oppressive contract labor system by encapsulating or insulating themselves from foreign ideologies while in the urban setting, and reassuming their traditional roles, statuses, and identities upon return to rural reserves. This strategy of cultural persistence is successful despite the addition of foreign language proficiency and the adoption of modern technological skills and innovations.

Spicer (1971) was the first to propose a general theoretical model to explain the phenomenon of organized resistance to cultural incorporation. He noted that certain populations, such as the Basques, Jews, Welsh, Catalans, and several Native American tribal groups, have demonstrated the ability to maintain their distinct identity systems in a variety of contrastive cultural environments. These "persistent peoples," he argues, share a number of common historical experiences with and strategies of opposition toward the controlling apparatus of dominant political states.

According to Spicer, a persistent cultural system is characterized by a unique set of symbols which are embodied in linguistic exclusivity, moral or ideal behaviors, music and rituals, and historical identification with a territory. All persistent peoples have been engaged in continual conflict with external agents over issues of political, demographic, ecclesiastical, and economic incorporation. The oppositional process itself typically intensifies collective consciousness and internal solidarity. This model provides a useful perspective in which to view Native American enclaves in the study area.

POLITICAL INCORPORATION (1.3.2)

The political incorporation process pursued by the United States government toward Great Basin Indians began in the mid-19th century with military campaigns accompanied by the usurpation of traditional lands and water resources by settlers, and by the imposed homelessness or segregation of Indians in less desirable land areas. Political incorporation was extended by the official granting of citizenship to Native Americans in 1924, and by the granting of direct control to the Bureau of Indian Affairs over the political, social, and economic internal affairs of reservation communities.

In a series of policy actions aimed at the detribalization of Indian peoples, the government encouraged the dependency of reservations on the dominant culture for economic and technical aid, and sought to usurp the role of parents and tribal elders in the enculturation process. Children were removed from their homes and sent to agency boarding schools where the speaking of their native tongues was forbidden. Educational materials emphasized the inferiority of traditional Indian cultures and teachings, and imparted a distorted, negative view of tribal histories and the events surrounding Euroamerican colonization. Despite these efforts, native lore and tradition was successfully transferred to succeeding generations, and bilingualism, rather than linguistic assimilation, prevailed.

In 1934, the government redirected its policy toward Native Americans from detribalization to one of cultural and ethnic pluralism. The Indian Reorganization Act provided for the drafting of constitutions and the formation of reservation governments on the Euroamerican plan. This move was designed to instruct Native Americans in self-government, and to incorporate their communities into the political process of the dominant society. As noted by Spicer (1971:799), increased participation by persistent peoples in the political institutions of the larger nation-state is typically misinterpreted by members of the dominant culture as a sign of assimilation. More often, this new knowledge and sphere of operations is incorporated into the oppositional process. Indian reservations in the study area have become sophisticated in their interactions with federal agencies and private corporations, and have made use of state and national legal institutions to pursue actions which protect or expand their ethnic boundaries.

DEMOGRAPHIC INCORPORATION (1.3.3)

The invasion of the American continent by Europeans resulted in the territorial displacement of Indian populations, the disruption of aboriginal demographic units, and the artificial reconstitution of these units on reservations and colonies, often with members of formerly unrelated families or tribal groups. The most devastating demographic effect of colonization, however, was the introduction of

European pathogens, for which Native Americans had no natural immunities. Dobyns (1966) estimates that the aboriginal North American Indian population was reduced by 90 percent from the Discoveries Period to the 20th Century.

In the 19th Century, demographic incorporation in the Great Basin was encouraged by the failure of the government to honor treaty obligations. Inadequate reservation support forced Native Americans into white settlements. Southern Paiutes in Nevada/Utah suffered tremendous population depletion and sex ratio imbalances as a result of Mexican slaving operations. Moreover, the Mormon institution of "adoption" of Indian children created a class of assimilated Southern Paiutes who found difficulty in acquiring mates in either cultural group.

During the 20th Century, however, the successful enclavement of Native American communities, improved nutrition, and the persistence of cultural values regarding reproduction and family structure have led to a numerical replenishment of the Indian population. The current high birth rate of Native Americans has reversed the demographic incorporation which, a century ago, seemed inevitable.

ECCLESIASTICAL INCORPORATION (1.3.4)

Governmental agencies typically welcomed various Christian sects to establish missionary inroads on the reservations under their jurisdiction. Churches were encouraged to serve as assimilating agents, converting the Native American population to "accepted" religions. On most reservations, Indian traditional religious rituals were prohibited by law. It was not until 1978, with the passage of the American Indian Religious Freedom resolution, that this policy was officially abolished. Christian sects often competed with one another for converts on the same reservations, contributing to the development of political and social factions within Indian communities.

Possible reasons for the limited success of Christianity among Native Americans will be explored more extensively below in the discussion of traditional sacred areas. An important factor in the opposition of persistent peoples to ecclesiastical incorporation is their historical and symbolic relationship to ancestral territories. Native Americans in the Great Basin continue to live in their traditional Holy Lands where the visual evidences of tribal scriptures are a daily experience. For them, the land and the features it contains have served as constant reminders of their spiritual identity as Indians. The religious intolerance experienced during the reservation period intensified the internal solidarity of Native American enclaves by forcing the secret performance of traditional rituals. Participation in these native rites thus assumed an important role in the strategy of opposition to the Anglo American culture.

As in aboriginal times, the locus of political power in many Indian communities still lies largely in the hands of traditional religious and spiritual leaders. This pivotal decisionmaking structure has remained hidden from public view since the period of Euroamerican conquest.

ECONOMIC INCORPORATION (1.3.5)

Intensive population pressure associated with Euroamerican invasion of the Great Basin disrupted the ecological niches of indigenous populations. Natural

resources such as native flora and fauna were consumed and valuable land and water resources were taken for settlement.

As aboriginal economic adaptations became increasingly unfeasible, native peoples were gradually drawn into a new dependence on non-native economies for subsistence. In all areas of the Great Basin, wagon train and settler livestock were exploited for resources. Some groups, such as the western Ute, expanded their aboriginal international trade networks to Mexican markets, where both horses and Indian slaves were major commodities. Political conquest and incorporation, however, moved Great Basin Indians into permanent economic relationships with non-native populations. Implementation of the reservation policy was accompanied by the adoption of livestock herding and the cultivation of new crops. The wide variety of desired commodities and material goods made available by the colonist population eventually drew all Native Americans into the national market economy.

Modern reservation communities reflect the adaptability of Native American populations. The technological and marketing skills of the dominant culture have been incorporated as survival strategies, but the assimilationist goal of economic individuation has not been realized. Although in many areas wage labor by heads of household comprises the primary income, extended family networks continue the aboriginal pattern of mutual aid and the sharing of resources. Moreover, both reservations and colonies in the study area have developed communal enterprises, such as agricultural and livestock cooperatives and industrial parks. Aggressive programs are also currently underway to both protect and expand tribal resources, such as water and land. These actions represent new cultural strategies of adaptation to economic pressures.

Because communally held natural resources necessary for economic viability form the basis of demographic and political boundary maintenance, perceived threats to tribal water, land, and productivity are viewed as jeopardizing cultural survival.

SUMMARY (1.3.6)

Spicer's (1971) model of persistent peoples permits a clearer understanding of contemporary Native American concerns regarding the M-X program or any program by the dominant society. As populations which have maintained a distinct identity system through decades of assimilative pressure and adversity, contemporary Indian communities continue to face an uncertain future. Modern reservations and colonies experience a constant barrage of real or proposed external policy actions which are viewed as a threat to their persistence as distinct peoples. Among these are the potential loss or reduction of federal trust status, potential erosion of water rights and resources, grazing allotments, federal aid for economic development, and the desecration of sacred sites and areas.

The M-X program is interpreted by the majority of Native Americans as another step toward economic incorporation. Despite their adoption of modern technologies, contemporary Indians have not adopted a secular utilitarian attitude toward their ancestral lands. The persistence of a traditional cosmological perspective produces a sacred emotional perspective regarding native plants and animals, physiographic features created by supernaturals, and the many places where spirits reside. Since, in Indian belief, relationships in the universe are based

in reciprocity, it is feared that continued human interference with nature will generate forms of supernatural retribution. So central are traditional religious elements to the persistent identity system of Native Americans, that an assault on their holy lands is often viewed as a threat to their entire culture.

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2.0 ETHNOGRAPHIC OVERVIEW

2.1 TRIBAL DISTRIBUTIONS IN THE GREAT BASIN: PAST AND PRESENT

The cultural remains of Native American populations indicate that, with the exception of the Utah Colorado Plateau and southeastern Nevada areas, human occupation of the arid Nevada and Utah basin has been based on a hunting, fishing, and gathering economy for at least the past 10,000 years. There is little agreement among archaeologists, linguists, and ethnologists, however, concerning the chronological relationship of Indians encountered in this region in the 19th Century with those who employed similar tool inventories in ancient times. What is certain, however, is that the several linguistically related Native American tribes of Nevada and Utah were well-established in the area by historic times. Descendants of these peoples now reside on reservations in and adjacent to their former homelands, with which they maintain important cultural and affective ties.

ABORIGINAL TRIBAL DISTRIBUTIONS (2.1.1)

Native American tribal groups with historic ties to Nevada/Utah lands are the Washo, Northern Paiute, Shoshone, Ute, and Southern Paiute. With the exception of the Washo, who inhabited an area on the California-Nevada border, all Great Basin peoples in the historic period spoke a group of closely related languages of the Uto-Aztecan (Utaztekan) stock. The latter consists of several language families which extend from the northern Great Basin to Central America. The distribution of Uto-Aztecan languages in North America appears in Figure 2.1-1.

The languages of Northern Paiute, Shoshone, Southern Paiute, and Ute peoples belong to the single Uto-Aztecan language family designated Shoshonean (Kroeber, 1907) or, more recently, Numic (Lamb, 1958; Miller, 1966; Goss, 1968). The Numic family is typically divided into sub-families which connote degrees of genetic relationship. The aboriginal distribution of these sub-families and the Native American tribal groups with which they are associated appears in Figure 2.1-2.

Several attempts have been made by both linguists and archaeologists to establish the relative antiquity of Numic peoples in the Great Basin area. Some archaeologists have taken note of the basic similarity between the material culture and ecological adaptation of the historic Shoshone described by Steward (1938), and the cultural remains of the Desert Archaic peoples. Jennings (1957:3), for example, postulates cultural continuity in Great Basin cultures for the past 10,000 years. A contrasting group of theories on the origins of Numic-speaking peoples has been proposed by linguists who employ a dating technique called glottochronology to assess genetic relationships among languages and the span of time involved in their divergence from a common stock. Romney (1957), for example, dates the divergence of Numic and other related families from a common Uto-Aztecan ancestral stock at 1000 A.D., and further postulates a regional origin in Arizona. According to Romney, Numic peoples expanded into the Great Basin from the south in comparatively recent times. In contrast, Lamb (1958) dates the divergence of Uto-Aztecan language families at 3000 B.C. near the Arizona-Sonora border. He argues on the basis of allegedly close relationships between the Numic family and the Tubatulabal family of Uto-Aztecan (spoken only by the Tubatulabal Indians of southeastern California) that Numic peoples expanded into the Great Basin from the area of Death Valley around 1000 A.D.

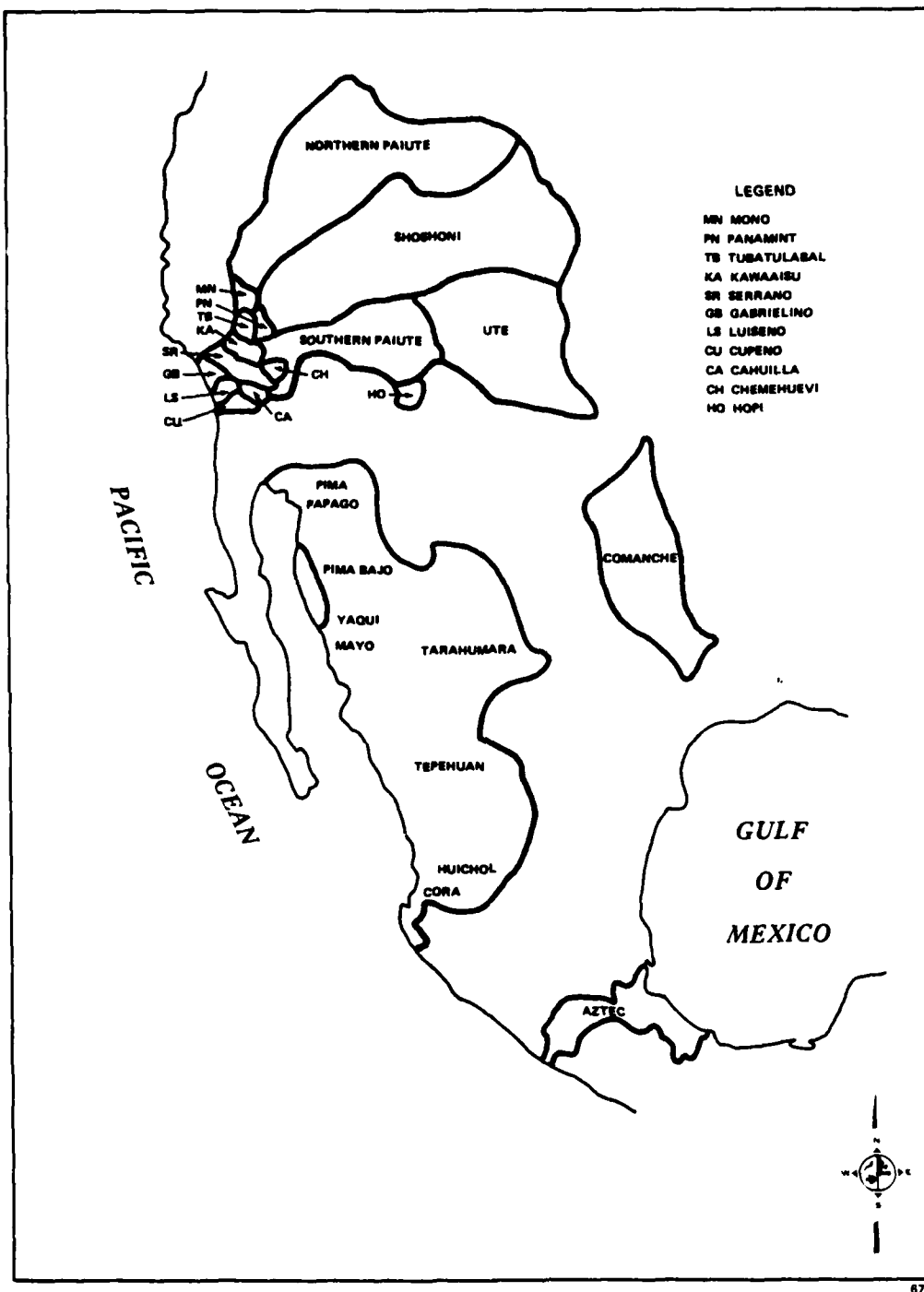
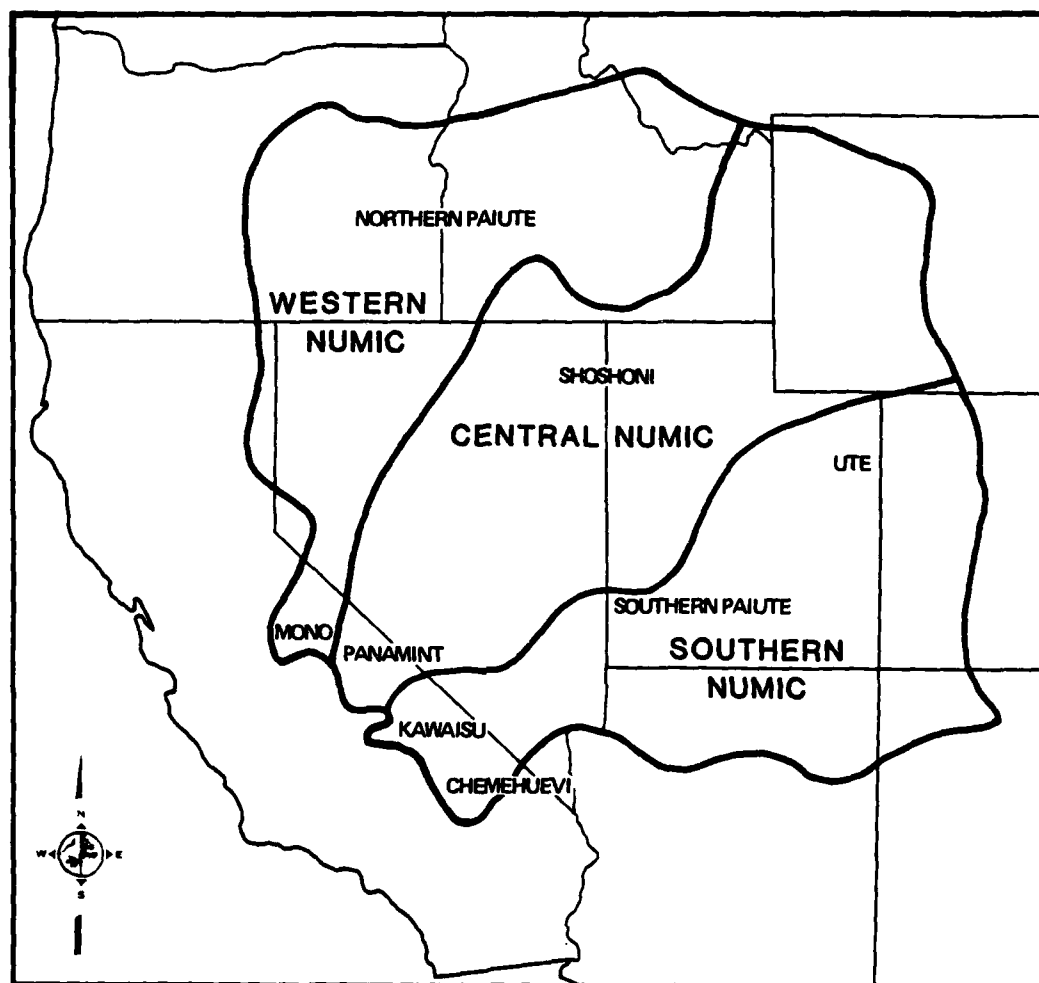


Figure 2.1-1. The Uto-Aztecan family of languages (adapted from Crapo, 1976).



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Figure 2.1-2. The Numic branch of Uto-Aztecan in the Great Basin area (adapted from Crapo, 1976).

The picture of Numic antiquity in the Great Basin area becomes even more confused when scholars attempt to combine data from linguistics and archaeology. Taylor (1961), Hopkins (1965), and others have utilized both glottochronological dating methods and references to archaeological cultural remains from various geological periods and areas to construct rather grand schemes of Uto-Aztecan linguistic diversification and migration in the western United States. Others, such as Madsen (1957), have attempted to correlate Lamb's (1958) theory on Numic expansion with the spread of Paiute-Shoshone pottery after 1000 A.D.

In a recent discussion of the problems involved in the linguistic prehistory of the Great Basin, Goss (1977) argues that the Lamb hypothesis (which posits Numic expansion into the Great Basin from the Death Valley area after 1000 A.D.) has become dogma. The uncritical acceptance of this theory, he notes, has resulted in several attempts to skew data to fit the model (Gunnerson, 1962; Hopkins, 1965; Miller, 1966; Goss, 1968; Fowler, 1972; Fowler, Madsen, and Hattori, 1973; and Madsen, 1975). As Goss (1977) points out, the Lamb hypothesis is based upon two assumptions, neither of which is scientifically substantiated: (1) that the Numic family is genetically derived from Tubatulabal, and (2) that the greater linguistic distinctiveness of Numic languages in the southwestern area of the Great Basin is indicative of greater antiquity (and hence the center of Numic origins).

Goss (1977) and Jett (1977) conclude that there is no linguistic evidence at present to discredit the view that the Numic language family diverged from an ancestral Uto-Aztecan stock in situ. In other words, the ancestral line of contemporary Paiute, Ute, and Shoshone peoples in Nevada/Utah may extend back to very ancient times. A recent archaeological study by Thomas (1973) supports the view that peoples with a Shoshonean cultural tradition have continuously occupied the Reese River Valley of Nevada from at least 2500 B.C. to the historic period. Debate over the relative antiquity of Numic peoples in the Great Basin may be expected to continue for some time. What is certain is that the ancestors of contemporary Indians of Nevada and Utah were well established in this territory centuries prior to Anglo-American contact.

There are many references to one or more of these Great Basin tribes in the diaries of explorers, missionaries, trappers, and settlers beginning as early as the 16th Century. The establishment of aboriginal tribal boundaries on the basis of these accounts, however, is complicated by incomplete or inaccurate observations, and by the fact that rapid depopulation and territorial displacement often preceded the recording of spatial distributions. Ethnographic field work and linguistic reconstructions begun in the early 20th Century provided the basis for the first joint attempts by Great Basin Indian specialists to establish the aboriginal territories of contiguous peoples. Such efforts, however, typically fell short of the goal to establish boundaries which were mutually agreed upon by Indian informants or the anthropologists themselves (cf. Park et al., 1938).

The most important catalyst for intensive and thoroughgoing research on aboriginal tribal distributions was passage of the 1946 Indian Claims Commission Act. The expert testimony required to both support and oppose Indian land claims initiated a long period of concentrated linguistic, ethnohistorical, and ethnographic study of the majority of Native American groups. Although the conclusions of expert witnesses, Indians, and the Justice Department were not always in agreement, the studies submitted are of sufficient magnitude and quality to establish former tribal distributions with a high degree of accuracy.

Ethnohistorical data on Great Basin Indians presented by witnesses before the Claims Commission are reviewed and evaluated by Stewart (1966) in an effort to establish the linguistic boundaries of tribal groups immediately prior to Anglo-American contact. The conclusions of this study are mapped in Figure 2.1-3.

As seen in Figure 2.1-3, ethnic divisions in the Great Basin correspond to linguistic divisions within the Numic family, with the further cultural distinction of Ute from Southern Paiute peoples. The Washo of California and Nevada, although culturally similar to the Numic peoples, speak a language of the unrelated Hokan stock. The aboriginal territorial boundaries submitted by the Washo tribe to the Indian Claims Commission lie to the west of suitable deployment areas in Nevada. In contrast, suitable deployment areas fall within portions of the aboriginal territories of the Northern Paiute, Shoshone, Ute, and Southern Paiute peoples. Cross-hatched areas in Figure 2.1-3 represent areas of joint occupancy and use by neighboring tribes, and may today be considered as of potential cultural interest to all parties concerned.

MODERN TRIBAL DISTRIBUTIONS (2.1.2)

According to Steward (1938:5-10), the events which marked the transition from aboriginal to modern tribal distributions in the Great Basin may be divided into four historical periods: (1) penetration of the area by explorers and trappers from 1776-1840, (2) the establishment of wagon train routes and of Anglo-American settlement in Utah and the Humboldt Valley of Nevada between 1840 and 1860, (3) intensive settlement by miners and farmers, and the climax of Indian hostilities between 1860 and 1870, and (4) the removal of Indians to reservations.

The initial contacts of Indians with Anglo-American explorers and trappers resulted in some sporadic skirmishes, but had few cultural or economic effects. Commencing in the 1840s, however, in-migrants destined for the West Coast began to traverse Utah and Nevada in considerable numbers. The ecological impact of European settlement in Utah and along the Humboldt River was immediate and severe. Indians in these areas were displaced from well-watered regions, and the grasses on which a significant portion of their subsistence depended were rapidly decimated by large herds of domesticated animals. The situation worsened for Indians with the discovery of the great Comstock lode at Virginia City in 1857. Within a decade, prospectors had penetrated the most remote areas of the territory, and in-migrant boom towns had sprung up at desert oases. Wherever such settlements occurred, native food plants were consumed by livestock and nut-bearing pinyon groves cut down for firewood.

The most serious resistance to settlement was launched by Utes, Shoshone peoples of northern Utah and Nevada, and by Northern Paiute bands, all of whom were equestrian and in possession of firearms. Serious clashes between the Northern Paiute and settlers began in 1860, whereupon the Shoshone of Battle Mountain and Austin also became involved. The Gosiute Shoshone and the Pahvant band of Utes began a long series of attacks on in-migrants, and systematically raided stages and the pony express in western Utah and eastern California. Utes of the Utah Lake region were united under Chief Walker, the "Napoleon of the Desert," as early as the 1840s, and conducted raids into southern California for cattle and horses. Several Ute chiefs gained prominence following Walker's death in 1855. Hostilities in Utah

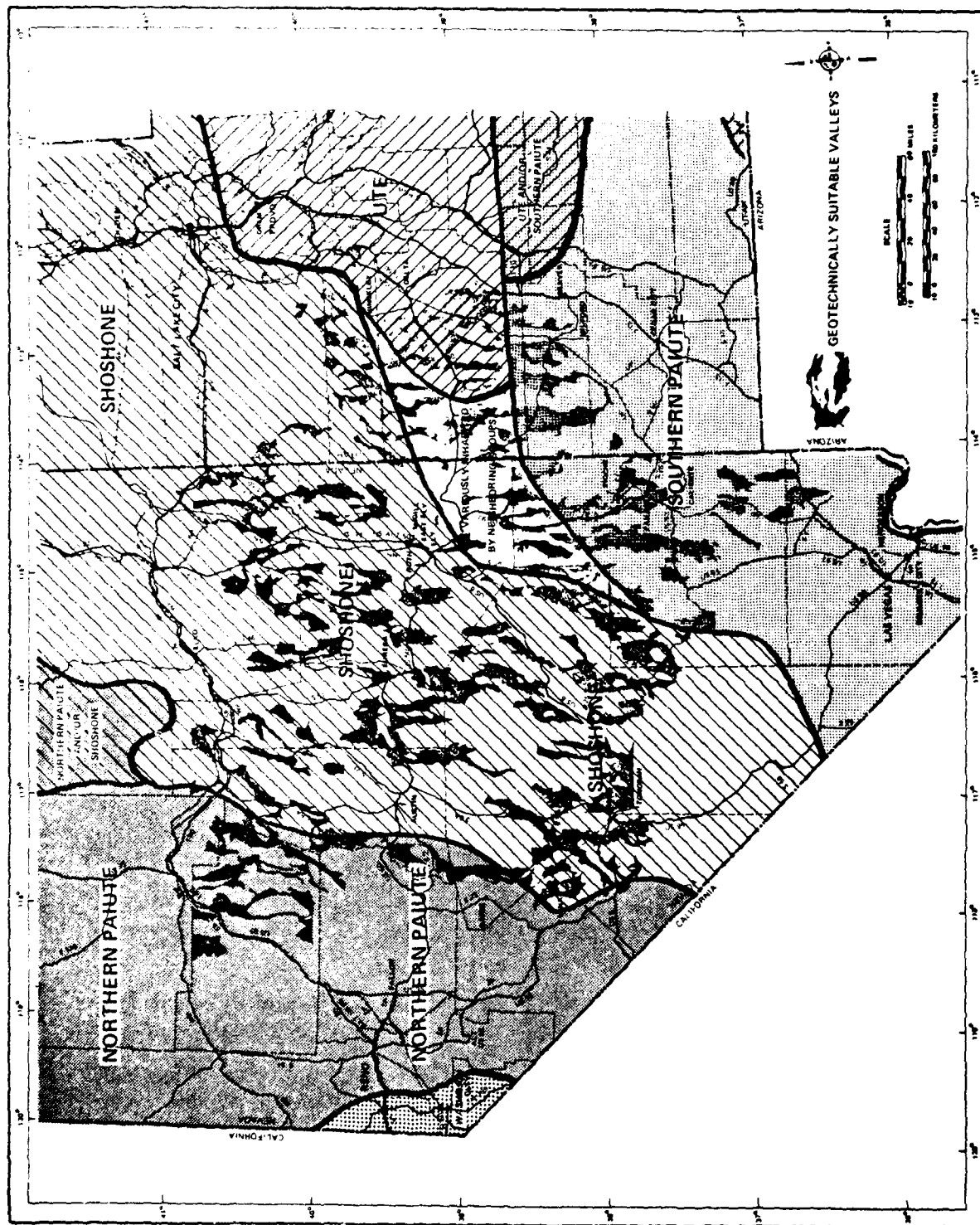


Figure 2.1-3. Aboriginal linguistic boundaries of Great Basin Indians
(after Stewart, 1966:207).

reached their climax around 1865 with the Black Hawk War. In southern Nevada and Utah, the Southern Paiute were subjected to settlement and missionizing attempts by Mormon settlers as early as 1850. By 1856, Paiutes began to launch attacks on wagon trains and settlers, the object often being procurement of cattle and horses for food.

Retaliation by the United States Army resulted in the rapid annihilation of Indian forces. The Steptoe Valley Massacre of Shoshones in 1862 led to treaties with Shoshone bands in 1863. Although sporadic skirmishes continued, and Northern Paiute bands failed to sign a treaty with American forces, Indian strife in the northern half of Nevada was virtually over by 1865. Shoshone bands of central Nevada fled to remote areas during the period of conflict, and were not involved in the hostilities. The Washo of western Nevada were themselves preyed upon by the Northern Paiute, and were decimated in their efforts to join Anglos against the common enemy. In Utah, several major skirmishes led to treaties in 1863, and the establishment of the Uintah Ute Reservation in 1865. Due to their lack of horses, Southern Paiute resistance never reached the scale attained by the Utes. Most Southern Paiutes were, by the 1870s, either on reservations or attached to Anglo settlements.

Indian reservations and colonies in Nevada and in Utah appear in Figure 2.1-4. In the 19th Century seven reservations were established in Nevada and Utah for Indian concentration. The Uintah Reservation was set aside in 1865 to accommodate Utes from the entire state of Utah. The Northern Paiutes were assigned land areas at Walker River in 1871 and Pyramid Lake in 1874. The Duck Valley Reservation was established for all Nevada Shoshones in 1877. In addition, land allotments for Shoshones were made in Ruby Valley in 1887, and the Fort McDermitt reserve set aside for Shoshones and Northern Paiutes in 1892. Southern Paiutes were established at Moapa River Reservation in 1875.

Governmental efforts to segregate Indians on these reserves before the turn of the century were not totally successful. Douglas (1870:95) reports that around 1870 nearly 90 percent of the Shoshone and Northern Paiute were still living in remote areas. Over the next few decades the paucity of native foods encouraged many Native Americans to attempt farming and cattle-raising on the assigned reserves. Some bands of Nevada and Utah Indians, however, refused to leave the areas of their heritage. These peoples, when unable to support themselves by living off land, moved into populated areas, and attached themselves in colonies to Anglo-American ranches and farms. The biological and cultural persistence of these Indian enclaves encouraged the establishment of scores of additional land reserves in Nevada/Utah between the turn of the century and 1972.

The Duckwater and Moapa Reservations are the only reservations within the proposed action area whose land and water resources may be directly affected by the Proposed Action. There are other resources, more widely distributed, that may also be affected within the region. These include availability, isolation, numerical representation in a locality, potential reservation expansion areas, human resources, shared norm and values, and cultural persistence. These potential impacts are possible not only to those reservations and colonies within the DDA but also those adjacent to, as well as those distant from, the DDA. These potential impacts extend far beyond the system suitability zone. The traditional ties of Native Americans with the land and with each other are important. What is more important, however,

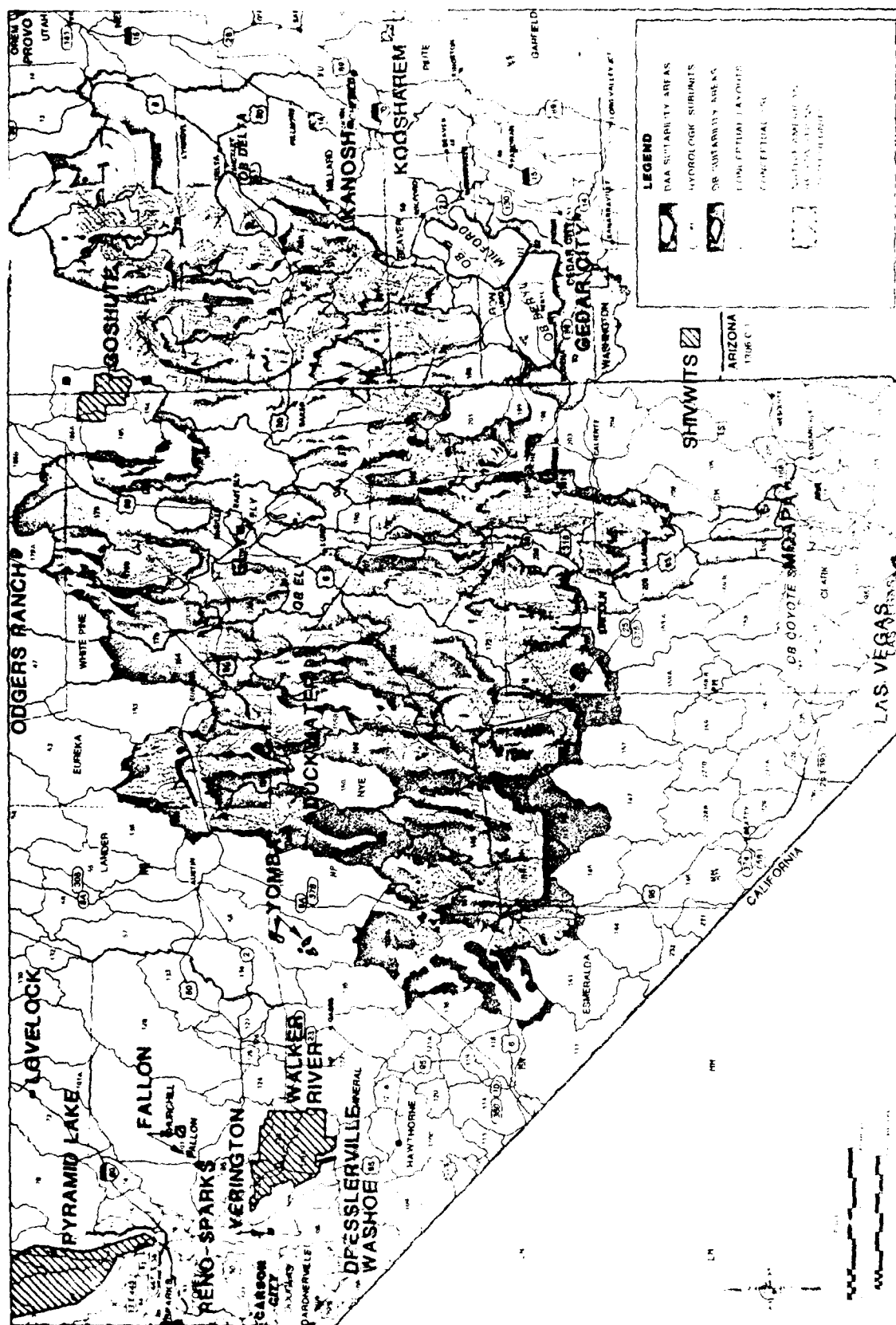


Figure 2.1-4. Indian reservations and colonies and Proposed Action conceptual project layout in Nevada/Utah (BIA, 1973).

are their present ties and uses. Reservation profiles are given in this technical report, not only because current reservations are congruent with aboriginal ranges but to document existing conditions. While this section deals with the Great Basin as a general sensitivity area, Section 3.0 concentrates on those reservations and resources more closely tied to the system suitability zone.

WASHO RESERVES (2.1.3)

The Washo people lost their aboriginal lands on the border of California and Nevada in the 1860s as a result of wars involving Anglo settlers, Northern Paiute bands, and themselves. While 580 acres (230 ha) of allotted lands, known as Woodsfords Colony, were made available in 1887 to Washo in California, the majority of Nevada Washo settled in colonies of their own making in the vicinity of Reno. Lands were subsequently set aside in this area beginning in 1917. The 40-acre (16 ha) Dresslerville Colony was established with the purchase of the Dressler Ranch by the government to provide farmland for the Washo. Carson Colony added an additional 160 acres (64 ha) for settlement. Tribal lands now include a 795-acre (318 ha) area known as Washo Ranches, 388 additional acres (155 ha) in Woodsfords Colony, and the 80-acre (32 ha) Alpine Colony in California set aside for Washo by the Department of Interior in 1970.

The Washo population numbered 500 persons in 1978 (BIA, 1978:143). The Woodsfords, Dresslerville, and Carson colonies are governed jointly by a 10-member Washo Tribal Council, and individually by Community Councils which serve as sub-councils. The Washo Ranches, owned and operated by the Tribe as a farming enterprise, are leased for alfalfa and hay farming, and for grazing. Individual Washo Colonies are today totally residential. According to the U.S. Department of Commerce (1974:300-301), elders in the Washo Colonies still speak their native language. Indian heritage in the form of traditional arts and crafts is reportedly retained at Carson City Colony, but virtually absent at Dresslerville. As will be noted below, the presence or absence of traditional crafts in contemporary Indian communities is an unreliable index of cultural persistence.

WASHO-NORTHERN PAIUTE RESERVES (2.1.4)

The Reno-Sparks Colony was established by land purchases made in 1917 and 1924 for displaced Indians of both the Washo and Northern Paiute tribes. This 28-acre (11 ha) reserve lies in the heart of Reno, and is almost entirely surrounded by industry. No water rights are attached to this tribally owned land. The Colony is purely residential, and has a population of 507 (BIA, 1978:130).

The Colony is governed by the six-member Reno-Sparks Indian Council. Only a few elders speak their native languages, and no traditional arts and crafts have been retained. Ethnic distinctions in this essentially urban community are apparently not marked, or have disappeared.

NORTHERN PAIUTE RESERVES (2.1.5)

Although the Northern Paiute never signed a treaty with the United States, two large reservations were set aside for their exclusive use in the 1870s, and an additional three reserves in the early 1900s.

Walker River Reservation

Walker River Reservation, established in 1871, is located approximately 100 mi (160 km) southeast of Reno. It consists of a total of 323,386 acres (129,330 ha), including 313,670 acres (125,268 ha) tribally owned, 8,752 (347 ha) individually allotted, and 964 acres (386 ha) owned by the federal government. There are 930 Northern Paiutes in residence (Walker River Tribal Council, 1980-1981).

The Reservation is governed by the seven-member Walker River Paiute Tribal Council. The Tribe owns and operates a tavern, gas station, and motel, and Reservation members have a Cattleman's Association. The Reservation has a potential for 6,000 irrigable acres (2,400 ha), 2,576 (1,030 ha) of which are now developed. In addition, a large iron ore deposit has been discovered, and exploration for copper and other minerals is currently underway.

Pyramid Lake Reservation

Created in 1874, this 476,669-acre (190,668 ha) reserve surrounds a lake regarded as sacred in Northern Paiute cosmology. Pyramid Lake, once threatened by water diversions from the Truckee River, is now being fed by additional flow from this source as a result of litigation. The Reservation has a membership of 665 Northern Paiutes (BIA, 1978:127), and is governed by the 10-member Lake Paiute Tribal Council.

Several tribal enterprises are underway. Wadsworth Industrial Park, currently under construction on Reservation lands, will provide the Tribe with lease income. A \$500,000 printing plant has already been contracted, and other lessees are pending. The Tribe has also negotiated a 20-year lease on 200 acres (80 ha) of lakeshore to the Washoe County Park and Recreational Department for recreational development. The Tribe also operates a fishery and fish hatchery. Reservation lands are used primarily for grazing, with 1,000 acres (400 ha) of 5,963 potentially irrigable acres (2,385 ha) currently developed.

The majority of Reservation members speak the Paiute language, and traditional beadwork is still done.

Lovelock Colony

This 20-acre (8 ha) reserve was established in 1907 for the Lovelock band of Paiutes, and currently has a membership of 143 (1980 est.). It is governed by a five-member Lovelock Colony Council, and is also a member of the Nevada Intertribal Council. The Colony is purely residential, and has little potential for commercial development. A large proportion of the population speaks the Paiute language.

Summit Lake Reservation

This reserve was established in 1913 and consists of 10,863 acres (4,345 ha), 9,689 (3,876 ha) of which are tribally owned. It is located in a remote area of northwestern Nevada, approximately 300 mi (480 km) north of Carson City. The Reservation envelops a lake, and is, for the most part, undeveloped, uninhabited virgin land. It contains only four cabins which are sporadically occupied by Indians in the summer for the commercial collection of trout eggs. No utilities are

available. Approximately 90 percent of the land is leased for grazing. No farming is undertaken, although 300 irrigated acres (120 ha) are available. Tribal affairs are governed by a six-member Summit Lake Paiute Council which meets alternatively in adjacent California and Oregon. Approximately 66 Paiutes are enrolled, all of whom live off the reservation in surrounding areas.

Yerington Reservation

Yerington Reservation consists of two land areas: (1) the 10-acre (4 ha) Yerington Colony, established in 1917, and (2) the 1,148-acre (459 ha) Campbell Ranch, purchased in 1936 and 1941. The Colony is located within the City limits of Yerington, and is purely residential. Campbell Ranch has excellent water rights, and presently contains 310 irrigated acres (124 ha) with a potential for 714 irrigated acres (286 ha). The Reservation is governed by the seven-member Yerington Paiute Tribal Council, and claims a membership of 385 (BIA, 1978:149). Few native Paiute-speakers are reported.

NORTHERN PAIUTE-SHOSHONE RESERVES (2.1.6)

Four Nevada reserves are shared by members of the Paiute and Shoshone tribes. The mixing of these neighboring tribes has occurred repeatedly since the late 19th Century. A contributing factor was the reluctance of some bands to relocate to distant areas, or their dissatisfaction with and subsequent relocations from newly established reserves. Thus, Shoshone and Paiute bands which agreed to occupy reservations in the 1800s sometimes subsequently shifted their residence to other reserves. Similarly, bands which remained in native areas found themselves homeless in the 20th Century, and often opted jointly for allotted parcels or communal Colony reserves made available by the government. All of these shared Indian reserve areas occur near the ancient tribal boundaries of the Paiute and Shoshone.

Duck Valley Reservation

The Duck Valley Reservation consists of 289,819 acres (115,928 ha) divided almost equally between the states of Nevada and Idaho. This reserve was established in 1877 for the western Shoshone, but many of that tribe opted to stay in their native areas of northern and central Nevada. The Duck Valley Shoshone were subsequently joined by Northern Paiute bands which settled on the north side of the Reservation in 1886. Today, ethnic distinctions between the two tribes are apparently secondary to relative socioeconomic status in the Reservation community. Total membership is listed as 982 (BIA, 1978:96).

Duck Valley is a relatively prosperous reservation with considerable potential for economic development. It is governed by the nine-member Shoshone-Paiute Business Council headquartered in Owyhee, Nevada. Several business establishments are tribally owned, and plans call for expansion of these facilities. Efforts are currently underway to acquire Wildhorse Reservoir to guarantee adequate water for recreational and farming development. The Reservation currently has 10,561 acres (4,224 ha) under irrigation, and a potential for 24,000 irrigable acres (9,600 ha). Mineral deposits are viewed as likely, but none has been discovered to date.

Fort McDermitt Reservation

Fort McDermitt, located at the Nevada-Oregon border, was established as a military post in 1867 and subsequently abandoned. In 1892, allotments were made available to Northern Paiute and Shoshone Indians under the Homestead Law. The Reservation now consists of a total of 34,810 acres (13,924 ha). All 18,269 acres (7,308 ha) in Oregon are allotted, whereas in Nevada 16,396 acres (6,558 ha) are tribally owned and only 145 acres (58 ha) allotted. The Reservation is governed by the eight-member Fort McDermitt Tribal Council, headquartered in McDermitt, Nevada, and has a membership of 424 Paiute-Shoshone (BIA, 1978:111). The Paiute language is still spoken.

Reservation terrain and elevation produce a limited growing season and inadequate year-round forage for intensive grazing. Irrigated agricultural lands, some 3,500 acres (1,400 ha), are limited to a floodplain, and are developed to maximum potential. The Tribal Council is seeking EDA funding for a water storage facility on the Quinn River for flood and irrigation control. Mineral deposits are unknown. The only notable prospect for economic development lies in the leasing of a building on Tribal lands to Western Products for use as an electronics factory.

Winnemucca Colony

Winnemucca Colony is a 340-acre (136 ha) reserve established for homeless Shoshones in 1917. Paiutes subsequently moved in from Fort McDermitt. The Colony today is strictly residential, and contains 25 persons from 9 families (BIA, 1978:146). Approximately 200 additional Indians live off the reserve in the town of Winnemucca. The Paiute language is still spoken. No development potential for the Colony is seen. It is governed by the four-member Winnemucca Tribal Council.

Fallon Reservation and Fallon Colony

Fallon Reservation is located 10 mi (16 km), and Fallon Colony 2 mi (3 km), west of Fallon, Nevada. Fallon Reservation was founded as a result of the General Allotment Act of 1887 with the granting of 196 allotments to Northern Paiutes living in the Sink and Stillwater area. In 1906 the Bureau of Indian Affairs and the Fallon Indians reached an agreement wherein some acreage was traded for water rights. An additional 840 acres (336 ha) were acquired for the Reservation in 1917. Several land transactions followed which brought the total acreage to 8,180 (2,190 ha). Of this number, 3,480 acres (1,536 ha) are tribally owned. The remainder, some 4,640 acres (1,856 ha), is held in individual allotments which have, over the years, developed large numbers of heirs and the attendant problems of multiple ownership. Fallon Colony was established at Rattlesnake Hill in 1917, and consists of 60 tribally owned acres (24 ha). The two Fallon reserves are governed jointly by the seven-member Fallon Business Council which serves a combined membership of 669 Paiute-Shoshone of whom 140 live off reservation.

Economic development is planned for both the Colony and Reservation lands. The Business Council has proposed to set aside 34 acres (14 ha) in the Colony for construction of an industrial park. Plans for the Reservation call for the expansion of agricultural and livestock enterprises. Some 2,270 acres (908 ha) are currently under irrigation, with a potential on the Reservation for 3,765 irrigable acres (1,506 ha). The Fallon Indians are currently attempting to develop that potential 1,495 acres (598 ha) of irrigable land.

Traditional crafts such as beadwork, cradleboards, and basketry persist.

SHOSHONE RESERVES (2.1.7)

Nevada Reservations and Colonies whose members identify exclusively with Shoshone cultural heritage are, for the most part, composed of the descendants of Shoshone bands who refused to relocate to the Duck Valley Reservation created for them in 1877. Their persistence in native areas and their eventual homelessness due to Anglo land appropriations led to a long series of reserve area purchases by the government.

Te-Moak Western Shoshone

Members of several reservations and colonies in north-central Nevada claim direct descent from the Shoshone bands allied under Te-Moak, the Shoshone chief who signed a peace treaty with the United States in 1863. This tribal identity is underscored by the Te-Moak Western Shoshone Council, a governing body of six persons which has total jurisdiction over all matters concerning lands of member reserves. Te-Moak Shoshones consist of the following:

Battle Mountain Colony. This Colony, located near the junction of the Humboldt and Reese rivers, consists of 683 tribally owned acres (273 ha) purchased for the Shoshone in 1917. Battle Mountain band members claim direct descent from Shoshones allied under Chief Te-Moak. The six-member Battle Mountain Community Committee has jurisdiction over local affairs other than land. The Colony has a total of 175 members (Facilitators, 1980), 117 of whom live within the colony and the majority of whom speak the Shoshone language. Battle Mountain reserve lands have no potential for irrigation, contain no known minerals, and seem to offer little potential for development although plans exist to develop an R.V. park.

Elko Colony. This reserve consists of 193 tribally owned acres (77 ha) located near the town of Elko, Nevada. The majority of its 440 members speak Shoshone, and take considerable pride in their heritage. The Elko Colony was instrumental in the creation of the Te-Moak Council, which is headquartered at Elko. The seven-member Elko Community Committee controls local affairs other than land issues. None of the Colony lands is irrigable, and there are no current plans for economic development.

South Fork Reservation. Located 30 mi (48 km) south of Elko, this reserve consists of 13,050 tribally owned acres (5,220 ha). It was created specifically for the use of Te-Moak bands of Western Shoshone by the purchase of 9,000 acres (3,600 ha) in 1938-1939, and subsequent additions through 1941. The number of residents at South Fork is 98 (Facilitators, 1980). The majority of members speak Shoshone. The South Fork Reservation is active in the Te-Moak Council and participated in its creation. Local affairs other than land matters are coordinated by the seven-member South Fork Community Council. The Reservation has a potential irrigable land area of 3,763 acres (1,505 ha), only a small portion of which has been realized. The Te-Moak Council has placed high priority on the development of irrigation and range improvements at South Fork.

Odger's Ranch. Odger's Ranch is a parcel of 1,987 tribally owned acres (795 ha) located 150 mi (240 km) southeast of Elko. This reserve, which has 7 permanent residents (Facilitators, 1980), is under the jurisdiction of the Te-Moak Council. The development of irrigable land, estimated at 317 acres (127 ha), and the improvement of rangelands are listed as major priorities. Odger's Ranch includes an additional 40,000 acres (16,000 ha) in BLM permits.

Ruby Valley Reservation. The Ruby Valley reserve is located southeast of Elko, nearly midway between South Fork Reservation and Odger's Ranch. It consists of 120 acres (48 ha) which were allotted to individual Shoshones under the Allotment Act of 1887. The allotment was conveyed to the allottee in 1970 by a trust patent. Population figures for Ruby Valley are unavailable in the 1978 BIA statistics. A 1972 BIA estimate cited by the U.S. Department of Commerce (1974:326) indicated 40 persons in residence.

In addition to the Te-Moak Shoshone reserves, three other Shoshone federal reserve areas are found in central Nevada:

Ely Colony

Ely Colony, located at Ely, was established in 1931 for local Shoshone Indians who had no tribal rights on any other reservation. It consists of 93 tribally owned acres (37.2 ha), with an additional 10 acres (4 ha) leased from the County. Some 74 Indians reside on the reserve, and an additional 117 live in the Ely area (Facilitators, 1980). Some traditional crafts persist. The Colony is governed by the five-member Ely Colony Council. This small reserve is strictly residential, and has no potential for irrigation but plans exist for the development of a full service truck stop.

Yomba Reservation

Yomba Reservation is located in central Nevada approximately 180 mi (290 km) east of Carson City. It was created in 1937 for the descendants of Shoshone Indians living at the headwaters of the Reese River who refused to relocate after the Anglo-Indian peace treaty of 1863. The 4,718 tribally owned acres (1,887 ha) which make up the reserve consist of several old ranches which are interspersed with non-Indian ranches. The Yomba Reservation has 102 members (Facilitators, 1980). Local affairs are coordinated by the seven-member Yomba Tribal Council. Reservation lands are watered by a dam constructed by the BIA. Some 2,044 acres (818 ha) are under irrigation, and support a ranching economy. In addition to reservation lands, the Yomba Reservation Indians hold 268,397 acres in BLM grazing permits.

Duckwater Reservation

Duckwater Reservation is located in central Nevada 70 mi (112 km) southwest of Ely. The Duckwater area was settled by Anglo-Americans in 1868. Most Shoshones native to this region moved to the Duck Valley Reservation in northern Nevada after its establishment in 1877. The descendants of those who refused to relocate were ultimately granted a 3,815-acre (1,526 ha) tribally owned reserve in the Duckwater area. The Reservation has 124 resident members (Facilitators, 1980), and is governed by the six-member Duckwater Tribal Council. Duckwater Reservation lands contain 930 irrigable acres (372 ha), but no electrical power is

available and all facilities for water are individually owned. The reserve contains no known minerals, and has little potential for intensive economic development. Steady employment is a high priority concern of Shoshone members. In addition to Reservation lands, the Duckwater Indians claim to hold up to 800,000 acres (320,000 ha) in BLM permits (BLM estimates 352,000 acres) and have applied for its withdrawal.

GOSHUTE SHOSHONE RESERVES (2.1.8)

Indians who occupied the Great Salt Lake Desert area and Great Salt Lake drainage in aboriginal times have been referred to in the literature as Goshute, Gosiute, or Deep Creek Shoshone. Once thought to represent a distinct tribe, the Goshute are now recognized as Shoshone, both linguistically and culturally. When the Uintah Reservation in northeastern Utah was established in 1865 for Utah Ute Indians, no lasting provisions were made for the Goshute Shoshone. It is only in recent times that two reserves were set aside for them by the government in their native areas.

Goshute (Deep Creek) Reservation

The Goshute Reservation was established in Utah in 1914 and in Nevada in 1938. It is located on the Nevada/Utah border and consists of 109,013 acres (43,605 ha), 70,489 (28,196 ha) of which lie in Nevada and are tribally owned, and 38,524 (15,410 ha) of which lie in Utah, 37,523 (15,010 ha) being tribally owned. The Deep Creek Valley in Utah was a major area of population concentration for Goshutes in aboriginal times. Today the Reservation has a population of 377, with 225 additional members residing in the immediate area (Facilitators, 1980). Reservation affairs are coordinated by the six-member Goshute Business Council. A tribally owned company, Goshute Enterprises, constructs cattleguards and other steel fabricated materials. The Reservation contains no known minerals, but has a potential for 3,410 irrigable acres (1,364 ha). High priority has been placed on the development of irrigated lands and on range improvements.

Skull Valley Reservation

Skull Valley Reservation is located in Western Utah, approximately 35 mi (55 km) south of the Great Salt Lake. Skull Valley and the adjacent Cedar Mountains were important Goshute occupation areas in aboriginal times. The Reservation consists of a total of 17,444 acres (6,978 ha), 160 (64 ha) of which are allotted and 17,284 (6,914 ha) of which are tribally owned. Of the 87 Goshute members, only 3 families were in residence (Facilitators, 1980). The Reservation village, has recently been supplied with a water system and electrical power, and plans for a community building are underway. The three-member Skull Valley Band Council serves as a governing body. The Reservation recently built a missile testing facility on tribal lands, and has leased it to Hercules, Incorporated. This lease income will comprise 98 percent of the Tribal funds. Plans include the development of a tribal 300-acre (120 ha) irrigated farm. Water is available from Hickman Creek, and a 500 gpm well has been recently completed.

UTE RESERVES (2.1.9)

Uintah and Ouray Reservation

The Uintah and Ouray Reservation in northeastern Utah is one of the largest and most prosperous Indian reserves in the western states. Established initially in 1865, a series of additions in Uintah, Duchesne, Grand, and Wasatch counties brought the total Reservation lands to 1,012,163 acres (404,865 ha). There are 1,620 Utes in membership, of which 80 percent reside on the Reservation. Tribal affairs are coordinated by the seven-member Uintah and Ouray Tribal Business Committee.

A large number of tribally owned commercial enterprises are located on the Reservation. These include the Bottle Hollow Resort and Motel, Ute Tribal Livestock Enterprises, Ute Fab Corporation, Ute Research Laboratory, Ute Lanes Bowling Alley, Ute Indian Leathers, a farming enterprise, and a service station. The Tribe also has its own Fish and Game Department for the protection of their fish and wildlife. Mineral resources are abundant on the Reservation, and include oil and gas shale, tar sands, coal, gilsonite, bentonite, wurtzilite, phosphate, sand, and gravel. Timber is also exploited. The Reservation has considerable potential for increased recreational development. Tribal earnings for 1978 were estimated at \$8,760,000.

In addition, the Uintah and Ouray Reservation controls considerable water rights in Utah. Water allocations to irrigate 25,000 acres (10,000 ha) are currently held. The deferral of a portion of these rights to the Central Utah Project was to be mitigated by the development of campgrounds, hunting area, and of multiple reservoirs for waterfowl. The Ute tribe has recently cancelled this contract, however, over a dispute with the Utah Legislature concerning the extension of Tribal hunting and fishing rights.

The Ute traditional Bear Dance and Sun Dance are still held.

Other "Colonies"

Like the Shoshone of Nevada, some Ute bands refused to relocate to distant reservations following Anglo-Indian peace treaties. These Indians and their descendants attached themselves to settler communities in their native territories, and were not granted reserve areas within their aboriginal lands by the government. A small colony of Pahvant Utes was noted by Steward (1938:222) at Kanosh in west central Utah. The town derives its name from a famous Pahvant Ute chief, and lies in the aboriginal territory of this band. Ute colonies are also noted for Koosharem in central Utah and Blanding in southeastern Utah. Little information is available on these populations. The Kanosh Utes have intermarried with Southern Paiutes, and have blended with this group.

SOUTHERN PAIUTE RESERVES (2.1.10)

Las Vegas Colony

This colony consists of a 10-acre (4 ha) parcel in Las Vegas purchased for the use of Southern Paiutes in 1911. It has a residential population of 191 Indians (BIA, 1978:118), few of whom speak the native language. Local affairs are coordinated by

the seven-member Las Vegas Tribal Council. Colony lands have no agricultural potential due to inadequate water supplies and/or the infeasibility of their development. The location of this Colony in a major resort city, however, makes the land potentially valuable for commercial and industrial development.

Moapa River Reservation

Moapa was established in 1875 for Southern Paiute Indians, and consists of 1,186 tribally owned acres (474 ha). Some 616 acres (246 ha) originally allotted to individuals were returned to tribal ownership status through the voluntary relinquishment of their owners. The Moapa reservation's application for withdrawal of an additional 70,000 acres to the south and west of the present reservation has been approved and awaits Congressional action. Membership at Moapa is 189 (128 of whom reside on the reservation). The six-member Moapa Business Council acts as the governing body. The reservation currently has 750 acres (300 ha) under irrigation, and plans to increase that acreage with its new land acquisition.

The Moapa reservation has experienced considerable economic growth with the development of a construction company, a leathershop, and a greenhouse horticulture enterprise and the improvement in its ranching enterprise infrastructure. Development plans include a restaurant, gas station, and museum to benefit from tourism at Vally of Fire State Park. The reservation is dependent on the Muddy River (fed by the Muddy River Springs from groundwater originating in the White River drainages, Eaking, 1966) for domestic, agricultural, and industrial uses.

Utah Southern Paiutes

Five bands of Utah Southern Paiutes, the Indian Peaks, Shivwits, Koosharem, Kanosh, and Cedar City bands, were restored or confirmed to a federal trust relationship in April 1980. They had been terminated from that relationship in 1954. Enrollment is open and total membership is therefore undetermined. The act that restored trust status also provided for the acquisition of up to 15,000 acres of land to provide a reservation. These lands have not yet been selected, but will be selected within two years from federal, state, or private lands in Beaver, Iron, Millard, Sevier, or Washington counties, Utah.

After termination of the federal trust relationship the Shivwits Indian Reservation held onto its lands after termination by earning income for taxes through leasing. They currently hold 28,160 acres located 15 mi east of St. George, Utah. The Shivwits Reservation is primarily residential with grazing and mineral rights under lease to private concerns.

The Cedar City Colony in Cedar City, Utah is on 36.9 acres owned by the Church of Jesus Christ of Latter-Day Saints. The tribal council owns an adjoining 5 acres. They never had their own reservation. The Cedar City band is attempting to purchase the church-owned property.

The Kanosh Colony consists of 11 privately owned houses on 65-80 acres of privately owned land. When the trust relationship was terminated, reservation lands were allocated among tribal members but most of this 8,000 acres was sold.

The Richfield Reservation is a one acre Utah state reservation used as an industrial center with Southern Paiutes resident in the City of Richfield.

The Indian Peaks reservation of 9,000 acres was sold to the State of Utah to pay back taxes. It is now a game management area. The Indian Peaks population is dispersed among the other colonies, primarily Cedar City.

The Koosharem band ultimately sold all of its land, and is presently dispersed among the other colonies, primarily in Richfield.

Pertinent data on modern tribal distributions are summarized in Table 2.1-1.

2.2 TRADITIONAL FLORAL AND FAUNAL RESOURCES

The aboriginal pattern of plant and animal exploitation and the traditional religious significance of these species for Nevada/Utah Indians will be examined below. Contemporary use patterns by Native Americans and the relative importance of flora and fauna for cultural persistence will then be explored.

ABORIGINAL SUBSISTENCE PATTERNS (2.2.1)

With few exceptions, Native Americans in the Nevada/Utah area were wholly dependent upon the exploitation of wild plants and animals in aboriginal times. All adults were cognizant of native botany and zoology. Native Americans believed themselves to be one of the thousands of species in a common system. Flora and fauna were not viewed with scientific detachment, but were rather incorporated into universal cosmological systems. Human interaction with native animals and plants including killing and eating was rationalized and underscored on the sacred plane. Faunal species play significant roles in the creation myths of Native American peoples, which typically refer to mystic times When Animals Were People. Fauna are thus assigned human-like qualities, and are often regarded as potential bearers of messages from the spiritworld. Similarly, important plants were created in mystic times for human survival, several of which hold special powers which may be manipulated by religious specialists to heal or to promote evil.

Traditional religious systems provided the entire fabric of Native American cultures. Despite repeated efforts for the ecclesiastical incorporation of contemporary Indians, traditional beliefs have displayed tremendous resiliency and persistence. The continued exploitation and use of native flora and fauna in the traditional manner is an essential component in the maintenance of cultural identity. Access to traditional gathering and hunting areas has been of concern to Native Americans since Anglo-American contact. Historic and modern development have resulted in radical alteration of the environment and the destruction of native ecological populations in many areas. Remaining underdeveloped areas where native species persist are often restricted to public use or are themselves threatened with development. Native Americans are currently supporting efforts to preserve native flora and fauna, and to guarantee their right to exploit these protected and renewable resources in a manner consistent with traditional cultural usage. This pattern of preservation and selected group exploitation was behind nearly all historic Anglo environmental movements, from forestry and timber management in the southeast to hunting and fishing preserves in the northeast and range management in the west.

Table 2.1-1. Vital statistics on Nevada/Utah federal Indian reservations.

RESERVATION	COUNTY LOCATION	TRIBAL GROUP	ACREAGE ¹	DATE ESTABLISHED	POPULATION ESTIMATE	BIA AGENCY	TRIBAL HEADQUARTERS	TRIBAL GOVERNMENT MEMBERS ²
Battle Mountain Colony	Lander (NV)	Shoshone	683	1917	171	E. Nevada	Battle Mountain, NV	6 ³
Carson Colony	Ormsby (NV)	Washo	160 ⁴	1917	184	W. Nevada	Stewart, NV	10 ⁵
Dresslerville Colony	Douglas (NV)	Washo	40 ⁴	1917	188	W. Nevada	Stewart, NV	10 ⁵
Duck Valley	Elko (NV) / Owyhee (ID)	Shoshone/ N. Paiute	289,819	1877	982	E. Nevada	Owyhee, NV	9
Duckwater	Nye (NV)	Shoshone	3,815 ⁶	1940-1944	124	E. Nevada	Duckwater, NV	6
Elko Colony	Elko (NV)	Shoshone	19 ⁷	1918	440	E. Nevada	Elko, NV	7 ³
Ely Colony	White Pine (NV)	Shoshone	10 ³	1931	187	E. Nevada	Ely, NV	5
Fallon and Fallon Colony	Churchill (NV)	Shoshone/ N. Paiute	6,240	1917	669	W. Nevada	Fallon, NV	7
Fort Mc Dermitt	Humboldt (NV) / Malheur (OR)	Shoshone/ N. Paiute	35,166	1892	424	W. Nevada	McDermitt, NV	8
Goshute	White Pine (NV) / Juab (UT)	Goshute	109,013	1914	600	E. Nevada	Idapah, UT	6
Las Vegas Colony	Clark (NV)	S. Paiute	10	1911	191	W. Nevada	Las Vegas, NV	7
Lovelock Colony	Pershing (NV)	N. Paiute	20	1907	143	W. Nevada	Lovelock, NV	5
Moapa River	Clark (NV)	S. Paiute	1,186	1875	189	W. Nevada	Moapa, NV	6
Odger's Ranch	Elko (NV)	Shoshone	1,987 ⁸	1938	7	E. Nevada	- ³	- ³
Pyramid Lake	Washoe (NV)	N. Paiute	476,669	1874	665	W. Nevada	Nixon, NV	10
Reno-Sparks Colony	Washoe (NV)	Washo/ N. Paiute	28	1917	507	W. Nevada	Reno, NV	6
Ruby Valley	Elko (NV)	Shoshone	120	1887	- ⁹	E. Nevada	- ³	- ³
Skull Valley	Tooele (UT)	Goshute	17,444	1917	87	Utah and Oury	Fort Duchesne, UT	3
South Fork	Elko (NV)	Shoshone	13,050	1941	98	E. Nevada	Elko, NV	7 ³
Summit Lake	Humboldt (NV)	N. Paiute	10,863	1913	66 ¹⁰	W. Nevada	McDermitt, NV	6
Utah and Ouray	Utah, Grand, Duchesne, and Wasatch (UT)	Ute	1,012,163	1865	1,620	Utah and Ouray	Fort Duchesne, UT	7
Walker River	Churchill, Lyon, and Mineral (NV)	N. Paiute	323,326	1871	930	W. Nevada	Schurz, NV	7
Winnemucca Colony	Humboldt (NV)	Shoshone/ N. Paiute	340	1917	25	W. Nevada	Winnemucca, NV	4
Yerington	Lyon (NV)	N. Paiute	1,148	1917	385	W. Nevada	Yerington, NV	7
Yomba	Lander (NV)	Shoshone	4,718 ¹¹	1937	100	W. Nevada	Austin, NV	7

NOTE: The Kanosh, Cedar City, Koosharem/Richfield Indian Peaks and Shivwits Reservation Utah Southern Paiutes have recently been reinstated to federal trusteeship; their land base and enrollment is still open.

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¹ Acreage rounded to the nearest whole number.

² Tribal government officials include the total number of officers and members.

³ All matters regarding land are decided by the six-member Te-Moak Western Shoshone Tribal Council.

⁴ The Washoe Ranches include an additional 795 acres in Nevada.

⁵ Carson and Dresslerville colonies are also governed by a joint 10-member Washoe Tribal Council.

⁶ Duckwater also holds up to 800,000 acres in BLM permits.

⁷ Ely leases 10 acres from the county.

⁸ Odger's Ranch also holds 40,000 acres in BLM permits.

⁹ Combined population of South Fork, Ruby Valley, and Odger's Ranch is 145; Odger's Ranch has only 7; Ruby Valley had 40 residents in 1972.

¹⁰ Summit Lake has no permanent residents; all members live off the reservation.

¹¹ Yomba Reservation also holds 268,397 acres in BLM permits.

¹² Population is based on estimated residents. Membership, however, in a reservation provides entitlement to residence services and participation in tribal activities. Given the high mobility of the Native American population in these states, population estimates could include some non-resident members—especially those living adjacent to the reservation.

Sources: U.S. Department of the Interior, Bureau of Indian Affairs, *Information Profiles of Indian Reservations in Arizona, Nevada, and Utah*, 1978; U.S. Department of Commerce, *Federal and State Indian Reservations and Indian Trust Areas*, 1974. Facilitators, Inc., *Preliminary Field Data*, 1980.

Aboriginal Use Patterns

With the exception of some Southern Paiute groups who adopted limited cultivation from neighboring tribes, Nevada/Utah Indians in aboriginal times derived their subsistence primarily from the gathering of wild plant foods, supplemented by hunting and fishing. The extreme aridity which characterizes the major portion of the two-state area severely limited the development of localized, abundant, and perennial food supplies. Plant, animal, and water resources were widely scattered over large areas and were in short supply for the major portion of the year. Plants were available for exploitation for only short periods in the annual cycle, and this period varied from species to species and place to place. Moreover, annual fluctuations in rainfall affected not only the productivity of wild plants, but their distributions as well. All of these factors contributed to the low population densities and high spatial mobility of aboriginal Native American groups. Washo, Northern Paiute, Shoshone, Ute, and Southern Paiute peoples developed solutions to natural limitations based upon botanical and zoological expertise and an orchestration of activity and movement.

Major Resource Zones

According to Steward (1938:14-44), Native American subsistence in the Great Basin was most significantly affected by floral distributions. The distribution of plants not only influenced human population density and movement, but the distribution of game animals which provided dietary supplements. Five floristic zones were important as resource areas to Nevada/Utah Indians in aboriginal times.

Alpine Belt. This zone lies above the timberline over 11,000 ft (3,350 m) in elevation. The primary vegetation, namely grasses, was of only secondary importance to Native Americans in that it supported large game animals.

Aspen and Spruce Belt. In Nevada, this zone is limited to ranges in the central part of the state where elevations of 9,000-11,000 ft (2,700-3,350 m) occur. Trees such as fir, Engelman spruce, and whitebark pine were available for firewood, while willows were utilized for basketry materials. Several herbaceous food plants also occurred. Among them were fruits and several seed grasses, notably Agropyron, Agrostis, Poa, Stipa, and Trisetum. In Utah, the zone had a wider distribution in the Wasatch, Uintah, and other ranges which extend from 7,500-9,000 ft (2,250-2,700 m) in the central and southern parts of the state. It offered Douglas fir, aspen, pine, and the seed grasses noted above, as well as several species of berries.

Pinyon-Juniper-Mahogany (Nevada) Belt. This floristic zone, occurring roughly from 5,000-7,000 ft (1,500-2,100 m), is widely distributed in Nevada and Utah, and contained vegetation which was critical to the survival of Great Basin Indians in aboriginal times. Of primary importance is the pinyon tree (Pinus monophylla and Pinus edulis) whose annual fall yields of pine-nuts provided the majority of life-sustaining food stores during the barren winter months. Other important food plants were species of Agropyron, Poa, Stipa, Amenlanchier, and Rosa. The lower reaches of this belt were favored by some Great Basin peoples as winter village sites.

Artemisia Belt. This floristic zone typifies the bulk of lands in Nevada and Utah north of the 37th parallel and is the main area that would be directly impacted by the M-X system. Traditional exploitation of this widely distributed zone was

obviated by the scarcity of food plants which it contained. Due to conditions of high aridity, flora is xerophytic and generally limited to inedible desert shrubs and (in alkaline areas) salt desert shrubs. Herbaceous food plants and grasses are found only in rare moist areas, such as along streams and natural springs. Steward (1938:17) notes, however, that rabbitbrush, according to local Indians, replaced native seed-grasses in many areas after the introduction of livestock. Despite the relative sterility of this zone for food plants, several species were exploited for medicinal and manufacturing purposes. The Artemisia belt also supported important small game, such as the jackrabbit, and in limited regions was coursed by perennial rivers which provided fish on annual spawning runs. Winter villages were often located on these rivers, or on the upper fringes of this zone where springs or streams provided an adequate water supply.

Covillea Belt. This zone is the desert shrub counterpart of the Artemisia belt below the 37th parallel in the southwestern tip of Utah and southeastern portion of Nevada. It consists of arid, low valleys which contain occasional cacti and yucca. Southern Paiutes in these areas exploited the yucca, Joshua tree, cacti, and, in moist areas, mesquite and screw beans. As in northern latitudes, this lowest elevation zone was also important for small game.

Floral Foods

The major dependence of Great Basin Indians on plant foods was based not only on the relative scarcity of game, but on the storable nature of such foods for consumption during the long winter season. Seeds from grasses and various shrubs, and pine-nuts were the two most important storable plant foods. In addition, a large number of plant products, such as greens, roots, flowers, fruits, and berries were exploited for more immediate consumption. Although there is much ecological variation in plant populations throughout the Great Basin, the following species were widely distributed and of general importance to all aboriginal Indian groups. More complete plant lists are available in Steward (1938:21-30) and Chamberlin (1909, 1911).

Seed Grasses: Agrostis (redtop), Agropyron (bluejoint or wheat), Elymus (wild rye), Lepidium (peppergrass), Oryzopsis hymenoides, (Indian ricegrass), Poa (bluegrass), Triglochin (arrowgrass).

Other Seed Plants: Artemisia (sagebrush), Atriplex (saltbrush), Balsamorhiza (arrowroot), Chenopodium, Helianthus (sunflower), Juncas, Lappula (stickseed), Mentzelia, Pinus (pine), Rosa (wild rose), Salvia (-columbariae, chia), Sitanion (-hystrix), Sophia (tansymustard), Typha (cattail). Some Shoshone groups in east-central Nevada are known to have broadcast seeds, notably Chenopodium and Mentzelia, to increase the density of these wild seed-bearing plants at specific locations.

Greens: Allium (wild onion), Balsamorhiza (arrowroot), Cymopterus, Nasturtium (watercress), Ranunculus (buttercup), Stanleya (squaw cabbage), Taraxicum (dandelion). Greens were typically gathered in the early spring, and eaten raw or boiled.

Roots, Bulbs and Tubers: Calchortus, Cirsium (thistle), Claytonia, Fritillaria, Orobanche, Scirpus (bulrush or tule), Typha (cattail), Valeriana (-edulis, bitterroot). The roots of various cacti were also exploited.

Tree or Cactus Crops: Opuntia (prickly pear), Pinus (-monophylla and -edulis, pinyon nuts), Prosopis (-glandulosa, mesquite beans; in Covillea belt), Quercus (oak acorns), Strombocarpa (-odorata, screwbean; in Covillea belt).

Berries: Amelanchier (service berry), Grossularia (gooseberry), Lycium (red berry), Prunus (chokecherry), Rhus (sumac or squawberry), Ribes (currant), Rubus (raspberry), Sambucus (elderberry), Shepherdia (buffalo berry or buckberry), Smilacina (coyote berry), Vaccinium (blueberry).

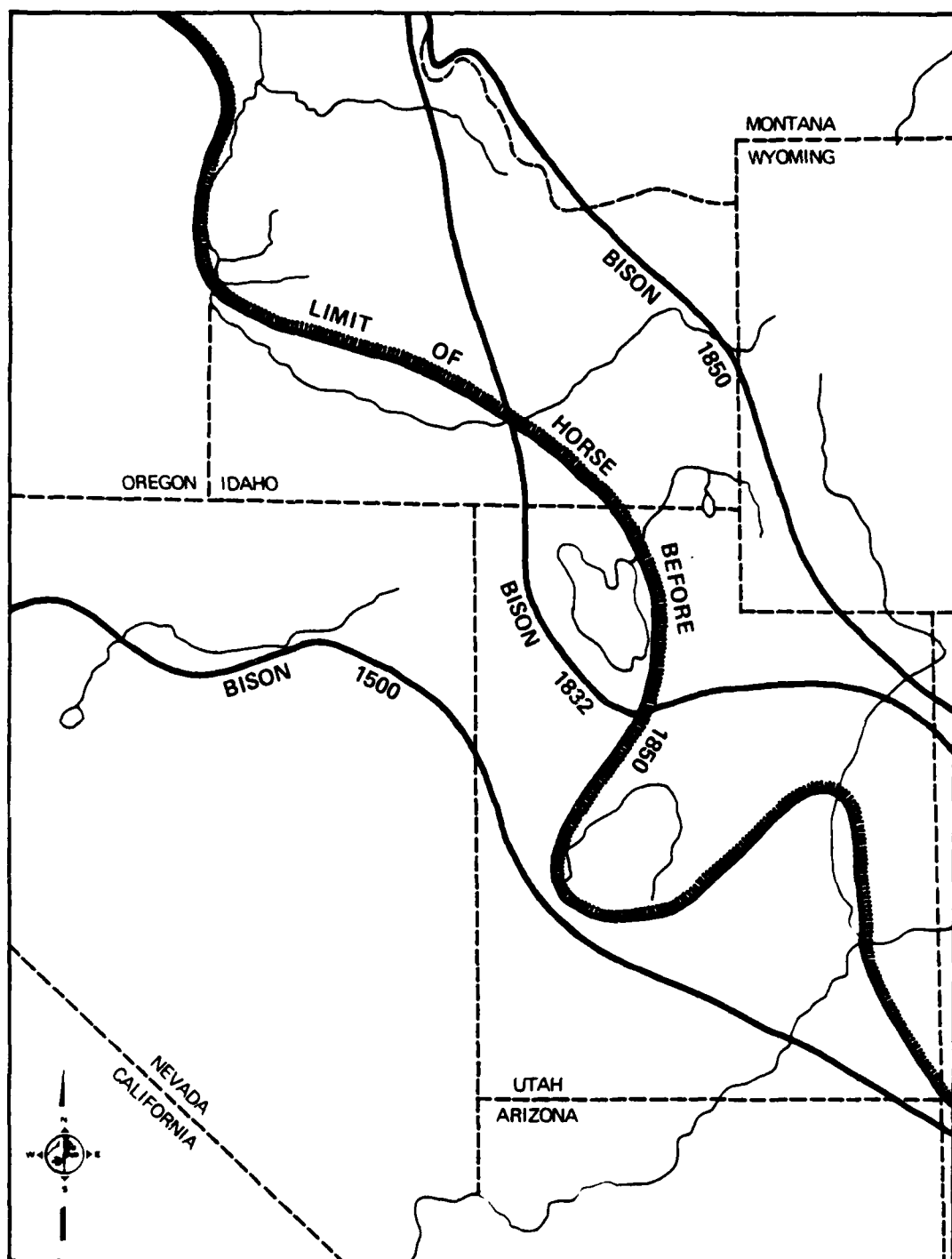
Faunal Foods

For most Great Basin Indians, animals played only a secondary role in subsistence. The aridity of most land areas in Nevada/Utah largely precluded sizeable herd animals which thrive in open grasslands. Small animals, such as reptiles, rodents, and insects, however, and smaller mammals were abundant, and generally supplied a year-round supplement to vegetable foods. The two-state area supported only a few perennial rivers, but where those occurred annual spawning runs of several fish species provided a storable protein food source for local groups.

Bison. Available evidence indicates that this large herd animal was distributed in the northern third of Nevada and throughout most of Utah around 1500 A.D. Bison had disappeared from Nevada and Utah by 1832, and from adjacent Idaho by 1840. Former distributions are illustrated in Figure 2.2-1. Extinction of the bison in these areas is typically related to over-hunting by equestrian Indians and early Anglo trappers. Prehistoric petroglyphs indicate that the bison was hunted by peoples immediately ancestral to the historic Northern Paiute, Shoshone, and Ute. Where bison hunting occurred, it undoubtedly allowed greater population concentrations (at least on a seasonal basis) than was possible by the historic period.

Mountain Sheep. Mountain sheep, averaging 300 lb (135 kg) in weight, were abundant in prehistoric times. They were formerly distributed throughout the Great Basin in grassy foothill areas, but more recently have retreated to more inaccessible mountain regions. Due to their sure-footedness on rocky promontories, they were difficult to hunt. Indians in historic times utilized dogs to isolate individual animals, or attracted them during their December mating season with the use of logs thumped to imitate the sounds of combating animals. The mountain sheep may have been of considerable importance in prehistoric times when larger herds inhabited open grassland areas.

Elk and Deer. Elk seem to have been limited to the extreme northeastern part of Utah, and were therefore unimportant to most Great Basin Indians. Deer, however, namely the mule or blacktail and the Virginia or whitetail varieties, were widely distributed and universally hunted. Deer congregated in small bands, and generally inhabited partially-wooded foothill areas. They were taken by individual stalking, or by small groups of hunters who drove them into ambush. Communal hunts commonly occurred in the spring and fall when deer migrated along established trails between high and low ground.



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Figure 2.2-1. Former distribution of bison in Nevada, Utah, and Idaho (after Steward, 1938).

Antelope. The pronghorn antelope was distributed throughout the Great Basin, save the Covillea belt of southern Nevada. Unlike the deer, antelope gathered into large herds in open areas of hills and valleys. Although individual animals were sometimes stalked, entire herds were typically driven by Indians into ambush. Large numbers of animals could be successfully taken by this method in aboriginal times, but one such hunt depleted the local antelope population for several years.

Rabbits. A major source of meat for Great Basin Indians in aboriginal times was the jackrabbit. These animals, averaging over 5 lb (2.5 kg) in weight, were distributed in very large herds throughout Nevada and Utah in the Artemisia and Covillea belts. Their gregarious nature and open habitat made them especially vulnerable to large-scale communal hunts. Large numbers of Indians, serving as a corps of beaters, drove the animals into a horizontally-stretched band of nets where they were easily slaughtered. Meat was dried for storage, and skins were utilized for blankets. The high fecundity rate of jackrabbits, unlike the antelope, guaranteed rapid natural replenishment of the herds. Smaller cottontail rabbits, inhabiting brushy foothill areas, were also taken with snares or bow and arrow.

Birds. Several species of waterfowl were exploited by Great Basin Indians located near marshy areas, playas, lakes, or streams. Prominent in this respect were mudhens, ducks, geese, and swans, as well as their respective eggs. Waterfowl were sometimes driven into nets, or onshore when molting or immature. Sagehens, wild turkeys, and a variety of small birds were also taken with dead-falls or bow and arrow.

Other Small Animals. Many varieties of smaller mammals and reptiles were taken throughout the year to supplement vegetable foods. Among these are the rockchuck, woodchuck, badger, porcupine, fox, beaver, marmot, mink, rats, prairie dogs, gophers, squirrels, lizards, and snakes. Insects such as locusts, grasshoppers, caterpillars, and ants were also welcomed if in sufficient numbers to justify the effort of their collection.

Fish. Fish were taken by all Great Basin Indians from springs and from temporary streams, marshes, and lakes created by the first melting of mountain snows. Only a few rivers and bodies of water, however, were sufficiently perennial to provide large supplies of fish. In Nevada, the Truckee, Walker, Carson, and Humboldt rivers and their tributaries supported annual spring spawning runs of trout, suckers, and mullet. Salmon runs were limited to the Snake River in adjacent Idaho. In Utah, fish were important to Indians inhabiting tributaries of the Great Salt Lake and Utah Lake, the Sevier River, and tributaries of the Colorado-Green drainage system. In these areas, fish were taken in huge quantities during spawning runs and dried for storage. They were also exploited on a more limited basis throughout the winter months. The Washo of western Nevada migrated annually to the Lake Tahoe area in the California Sierras for intensive fishing at the lake and surrounding mountain streams. Several methods were employed, including hook and line, hand collection in baskets, weirs and diversion dams, and nets.

Horticulture and Seed Broadcasting

Hoe farming occurred only among a minority of Southern Paiute groups in aboriginal times. Domesticated plants such as maize, beans, squash, watermelon, cantaloupe, and sunflowers were acquired from the Hopi. Nowhere did the yields of

such crops provide more than a supplement to the dietary staples of seeds and pine-nuts. Crops were typically planted with a digging stick on small plots which had been irrigated by the construction of a water diversion ditch from perennial springs. Plots thus planted in the early spring were left unattended until fall harvesting time, when Southern Paiute groups returned from their seasonal hunting and gathering rounds. In early post-contact times, cultivation was adopted by the Death Valley, Lida, Spring Valley, and Ely groups of Shoshone.

Some Shoshone groups in east-central Nevada and west-central Utah engaged in the deliberate sowing of wild plant seeds. This activity is known to have been associated with Shoshone of Small Creek, Reese River, Spring Valley and the Morey, Ely (Steptoe Valley), and Egan areas; and with the Goshute Shoshone of Deep Creek. Members of local groups in these areas employed communal labor for the irrigation of a large plot, and for seed broadcasting. Harvesting was undertaken by individual families. Chenopodium and Mentzelia appear to have been the predominant seed plants.

Seasonal Subsistence Cycles

Due to the generally sparse, scattered, and unpredictable nature of food resources, Great Basin Indians in aboriginal times ranged over considerable distances during the annual cycle. This wandering was not, however, without direction or consistency. All groups had at least one local home-base from which they radiated and to which they returned on a seasonal basis--a settlement pattern called transhumancy. Typically the winter village, where family-groups of larger local collectives congregated to live off stored food during the cold season, served as the locus of cultural identity and economic activity. The relative abundance of resources in a given area largely determined the nucleation and dispersal cycles of component family-units. Although ecological variation was considerable both between and within Nevada/Utah tribal groups, general patterns in seasonal subsistence activities and settlement may be discerned. These aboriginal patterns are outlined for Washo, Northern Paiute, Shoshone, Southern Paiute, and Ute Indians in Table 2.2-1.

Winter for all Great Basin tribal groups was a time to congregate with kinsmen and allied families which may have been separated during a major portion of the year. Such settlements among the Washo and some Northern Paiute bands were limited in size and local density by the availability of springs or perennial streams. Winter collectives among the Shoshone, Ute, and Southern Paiute more closely approximated true villages, composed of family-groups which exploited the same territory throughout the year. Subsistence during winter was derived primarily from stored seeds and pine-nuts, dried animal flesh (especially deer and rabbit), and dried fish. Hunting and, in some locations, fishing activities continued throughout the winter to supplement the eroding caches of food. The cold season provided the opportunity for heightened indoor activities, such as basketmaking and the crafting of stone tools. It was also the time of extended story-telling, when elders conveyed the knowledge and lore of the tribal culture to others. Food stores often became exhausted by late winter or early spring. This annual famine period was often a time of illness and death for the elderly and very young. Food shortages motivated Southern Paiute bands to disperse prematurely from winter villages to the lower canyon areas for the collection of mescal, cacti, and juniper berries--foods which were exploited only under the threat of starvation.

Table 2.2-1. General seasonal subsistence and settlement round of Great Basin Indians.

W I N T E R				
WASHO	NORTHERN PAIUTE ¹	SHOSHONE	SOUTHERN PAIUTE	WESTERN UTE ²
Settlement in small camps along eastern Sierra foothills in areas with adequate water and firewood supplies. Primary subsistence derived from cached foods acquired earlier in the year. Time of basket- and tool-making. Late winter the famine season.	Settlement in small camps along valley lakes and streams. Primary subsistence derived from stored foods. Hunting of small animals and ice-fishing throughout the winter supplemented diet. Willow-gathering and basketmaking are important winter activities. Late winter the famine season.	Settlement in winter villages (ideally served as home bases for several family groups which exploited the same territory on an annual basis) located in well-watered foothill areas. Primary subsistence derived from cached foods acquired during the year. Late winter the famine season.	Winter villages located at springs, perennial streams, or lakeshore served as communal home base for allied family units or bands. Primary subsistence derived from stored food, with supplementary hunting, winter rabbit drives and ice-fishing in some areas. Late winter the famine season. In some areas, Southern Paiutes left winter villages to collect mesquite, cacti, and juniper berries (known as "starvation foods") in canyons.	Members of communal band territories nucleated into winter villages, generally in valley areas along perennial streams or lakes. Primary subsistence from stored pinenuts, vegetable foods, dried meat and fish. Large and small game hunting continue throughout the winter, with some ice-fishing. Late winter the leanest season, but no reports of widespread famine.
S P R I N G				
Gathering of greens, roots, and tule in valleys with first melting of snows. Trek of young men and women to Lake Tahoe to establish early fishing villages. Gathering and hunting. Gradual trek of remaining Washo (elderly and very young) from winter camps to Lake Tahoe villages.	Gathering of cattails and desert greens, hunting of waterfowl. Late spring nucleation of camps into fishing villages on rivers for spawning runs. Harvested fish dried for storage.	Limited gathering expeditions from winter villages with first melting of snow. Communal deer hunting along deer migration trails. Gathering and fishing in low hills, lakes, and streams. Winter village remains home base.	Crops planted at winter village in spring by some Southern Paiute groups. Gathering expeditions undertaken by family groups or communally by entire band to lower elevation areas. Hunting of small game supplemented diet. For Southern Paiute in lake and perennial stream regions, spring was the primary fishing season.	Large communal fishing villages, for intensive collection of trout, suckers, and mullet on annual riverine spawning runs. Time of feasting and performance of Bear Dance, for which several Ute bands may nucleate. Reported that Utah Lake was the annual spring gathering place for all Ute bands within a 200 mi. radius by the 1840s. This nucleation was aided by acquisition of horses.
S U M M E R				
All Washo assembled in Lake Tahoe villages by early summer. Intensive fishing during annual spawning runs of trout and sucker. Harvested fish dried. Dispersal of Washo families to higher elevations for fishing, hunting, and gathering by mid-summer. Return of Washo to camps in valley floor regions in the late summer for intensive gathering and hunting.	Dispersal into small mobile camps for harvesting of desert seeds; hunting of small game. Hunting of waterfowl, and harvesting of Indian rice grass by mid-summer. Berry harvesting and the hunting of small game. Scouts deployed in August to find pinyon groves with promising crop. Prayer rituals at grove and summer camp for successful harvest.	Dispersal of family groups from winter village for extended seed gathering expeditions in moist hills and desert valleys. Seeds cached in hills. Movement back to hills as seeds ripened near winter village. Harvesting of rice grass by mid-summer, and communal antelope drives in lower sagebrush belt. Return to hills in late summer to gather roots, berries, and tule. Communal rabbit drives in lower sagebrush belt.	Some Paiute groups returned in summer to home base winter villages to gather seeds in valleys and higher elevations. Others in lake areas dispersed in small groups in early summer to the plateaus for foot gathering and hunting. In late summer, Paiute groups in arid regions moved to plateaus for gathering and the hunting of large animals. In lake areas, late summer was associated with the nucleation of band members in valley areas for gathering and communal rabbit drives.	Dispersal of family groups within band territories for gathering and hunting. Band chief sends messengers to family camps when prime seed-gathering areas are encountered. All band members converge on such areas intermittently throughout the season for intensive gathering.
F A L L				
Gathering, fishing on lower streams continues. Intensive hunting of large and small game. Washo camps gather in lower mountain areas by late fall for pinyon harvest. Pinenuts cached in caves. Time of plenty and festivals. After nut harvest, winter camps established in foothills, firewood gathered. Large communal rabbit drives conducted in valleys. Intensive hunting and gathering for accumulation of winter food stores until first snows.	Northern Paiute camps gather in pinyon groves for pinenut harvesting; crop cached in pits; hunting of small game. After primary nut harvest, all but young and infirm summoned by rabbit-chief to large desert camp for communal rabbit drive. Time of feasting. Meat dried for storage. After rabbit drive, camps disperse back to hills to hunt, and to gather remaining fallen pinenuts. In late fall, winter camps re-established along valley lakes and streams. Intensive hunting and gathering to build up winter stores.	Convergence of family groups in area of good pinenut crop and establishment of winter villages. Harvesting and storage of pinenuts. Time of plenty and festivals. Large-scale communal rabbit drives organized in valleys. Return to winter villages for intensive hunting and gathering until first snows. Communal hunting of deer along deer migration trails.	Fall was the season of plenty and festivals. Most Paiute groups gathered pinenuts, roots and seeds on adjacent plateaus and conducted communal hunts of large game. Following the pinenut harvest, winter villages were reoccupied, and any planted crops were harvested. Communal rabbit drives occurred in moist areas. Intensive hunting and gathering to increase winter stores.	Trek to adjacent mountain areas for pinenut harvesting and deer hunting. Return to winter villages for rabbit drives and other intensive hunting, fishing, and gathering activities prior to the onset of snows.

¹Based largely upon data for Northern Paiute of the Truckee and Carson river drainages.

²Information on the pre-horse Ute subsistence found is scant. It is assumed that prior to horse acquisition, Ute subsistence and settlement patterns were similar to those of the Shoshoni and Southern Paiute, but with a heavier dependence on fishing. The horse allowed greater band cohesion and mobility than was possible in early times.

Sources: Downs (1966); Kelly (1964); Malouf (1974); Stewards (1938); Thomas (1973); and Wheat (1967).

With the first melting of desert snows in early spring, all Great Basin Indians undertook gathering expeditions from winter villages to the low hills and valleys. There they exploited leafy plants or "greens" and roots in areas which would in a few weeks become parched by the desert sun. Plant foods were eaten fresh or boiled, and no surplus storage was possible. Early spring was also a time of heightened hunting activity. In marshy areas, peoples such as the Northern Paiute and Ute undertook communal hunts of waterfowl which had returned from their seasonal migrations. Early spring was also an important deer hunting season. Ambushes and pitfalls along established trails were utilized by groups of hunters to exploit deer which migrated annually to high ground with the melting of snows.

Fishing was undertaken by all Great Basin Indians in watercourses created by spring mountain streams. For some groups, however, notably those occupying perennial rivers and lakes, spring fishing activities provided a major source of storable food. Among the Washo, young men and women left their overburdened winter villages in early spring, and migrated to Lake Tahoe. There they established the fishing villages at which all Washo would assemble by early summer. These young, typically unmarried people supported themselves by fishing, hunting, and gathering, and enjoyed an extended courting period free from the supervision of elders. For some Northern Paiute bands, late spring marked their nucleation into communal fishing villages for the annual spawning runs of fish on the Truckee and Walker rivers. Great numbers were taken and stored for future use. A similar pattern held for Shoshone bands in the Humboldt River drainage, Southern Paiute bands in lake and perennial stream areas, and for Western Ute bands of the Great Salt Lake drainage and Bonneville Basin. Fishing provided such a reliable food source for Utes of the Utah Lake, Sevier River, and Fish Lake areas that family-groups which composed larger band units were able to remain together throughout most of the year.

By early summer, all Washo had assembled at Lake Tahoe for the annual spawning runs of trout and suckers. After amassing large quantities of fish and drying them for storage, village members dispersed into higher ground for fishing in other mountain lakes and streams, and for hunting and gathering. Early summer for the majority of other Great Basin Indians marked the beginning of intensive seed-gathering. Family-groups dispersed throughout the lower hills and valleys to harvest the grasses which had sprung up from the winter moisture. Great distances were covered on these expeditions, with gradual movement of groups to higher elevations as the warm season progressed. Harvested seeds and roots were usually cached in the foothills near winter villages sites, to which the family-group hoped to return in a few months. In some tribal groups, such as the Western Ute, the activities of family-groups which made up a common territorial band were coordinated by a chief who sent messengers to inform members of primary seed-gathering areas. By mid to late summer, Washo bands had also migrated back to the valley areas for seed-gathering activities.

As the summer drew to a close, Great Basin Indians began to anticipate the most important phase of the annual gathering round, namely the fall pinyon harvest. Shoshone and Southern Paiute groups migrated from arid regions to plateau and foothill areas to hunt large game and to await the ripening of pine-nuts. Northern Paiute bands sent scouts to the neighboring hills to locate promising pinyon groves, and conducted ceremonials to ensure plentiful crops. Western Ute bands made preparations for the long trek to mountain areas for the pine-nut harvest.

Fall was a time of plenty and festivities for all Great Basin Indians. Family-groups and local bands nucleated in foothill pinyon groves for the intensive gathering and storage of pine-nuts. The harvest, which lasted for two to four weeks, was followed by large communal rabbit drives in the surrounding valleys. All subsistence activities were heightened in anticipation of the long winter season when stored foods would provide the measure against starvation. By late fall, winter villages were well-established and huge supplies of firewood had been accumulated. The communal hunting of deer and of other mammals now fattened for winter hibernation provided the last major source of storable food before the onset of winter snows.

Manufacturing and Pharmaceutical Uses of Flora and Fauna

For Indians of the Great Basin, survival depended not only upon the successful exploitation of flora and fauna for food, but on the additional knowledge and use of selected species for manufacturing and pharmaceutical purposes. The persistence of traditional crafts among contemporary Native Americans for commercial purposes and for the education of their children is marked. Similarly, modern Indians often express a preference for traditional medicinal remedies over commercial products in the treatment of minor ailments. These patterns warrant closer examination of the floral and faunal usages in aboriginal times.

Organic Manufacturing Materials. Game animals were utilized in aboriginal times for a variety of products. The fur hides of rabbits and occasionally bears were made into warm winter blankets. Deer hides were tanned for clothing and containers. Horn and bone material from butchered antelope, deer, and other game animals was utilized for scrapers, flaking tools, ornaments, and a variety of household utensils. Among some Great Basin Indians, eagles were captured from aeries when immature and raised at encampments to ensure a source of feathers for arrows. Some of the major plants utilized in traditional manufactures are listed in Table 2.2-2. Of all the traditional crafts practiced by Great Basin Indians, basketry is perhaps the most famous and most persistent. All tribal groups possessed the skills of intricate weaving and basketmaking for containers required in gathering, food-processing, and food storage. Some vessels were so finely woven that they were watertight, and could be used for water transport on long treks into the desert. These handsome basketry pieces continue to be made by skilled Native American women, and claim high prices in the commercial market. Raw materials for this craft are regarded as important cultural resources.

Medicinal Plants. All Great Basin Indian tribal groups were knowledgeable in pharmaceutical applications of native flora for common ailments. Wounds, bruises, sores, and rheumatism were typically treated with ground leaves or roots prepared into ointments or poultices. A wide variety of minor internal ailments, such as colds, fever, and digestive problems were countered with oral medicines. Roots, leaves, flowers, or entire plants were made into teas, or boiled and the resultant liquid drunk. Knowledge of successful techniques for the setting of broken bones was commonplace among adults. The medicinal inventory of the Ute Indians also included veterinary preparations for horses. A list of common medicinal plants and their traditional applications appears in Table 2.2-3. The precise nature of more serious life-threatening or fatal illnesses among Native Americans in aboriginal times is less well known. In Table 2.2-3 it is notable that introduced catagions, such as smallpox and venereal diseases, were initially treated (no doubt unsuccessfully)

Table 2.2-2. Major plants used in manufacturing in the Great Basin and the traditional usage.

SPECIES	COMMON NAME	TRADITIONAL USAGE
<i>Amaichoer</i>	june berry	Basketry materials
<i>Amelanchier</i>	service berry	Basketry materials; bows
<i>Apocynum</i>	dogbane	String (from dried bark)
<i>Artemesia</i>	sagebrush	Fire drills; tinder; twined bags and garments; rabbit nets; houses and windbreaks; hunting enclosures
<i>Cercocarpus</i>	mountain mahogany	Basketry designs (dye); arrows; bows; digging sticks
<i>Echinocactus</i>	devil's pincushion	Awls
<i>Epilampes</i>	grass	Coiled basketry foundation
<i>Equisetum</i>	scouring-rush	Whistles
<i>Juncus</i>		Basketry materials (yellow designs)
<i>Juniperus</i>	juniper	Bows; house frames; kindling
<i>Martynia</i>	devil's claw	Basketry materials (black designs)
<i>Pinus</i>	pinyon	House frames and coverings
<i>Phragmites</i>	reed or cane	Arrow shafts
<i>Populus</i>	cottonwood	Basketry materials
<i>Rhus</i>	sumac, squawbrush	Basketry materials (white designs); cradleboards
<i>Ribes</i>	currant	Arrow shafts
<i>Salix</i>	willow	Basketry materials
<i>Sambucus</i>	elder	Flutes
<i>Sarcobatus</i>	greasewood	Arrows; digging sticks
<i>Scirpus</i>	tule	Sleeping mats
<i>Shepherdia</i>	buffalo berry	Basketry designs (dye)
<i>Sphaeralcea</i>	desert mallow	Pottery materials (syrup, mixed with clay)
<i>Symphoricarpos</i>	snow berry	String (from bark); cradleboards
<i>Yucca</i>		Basketry materials; firedrills

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Sources: Chamberlin (1909, 1911); Kelly (1964); Malouf (1974); Steward (1938); Wheat (1967).

Table 2.2-3. Common medicinal plants of Great Basin Indians and traditional usage.

SPECIES	GENUS OR COMMON NAME	TRADITIONAL USAGE
<i>Abronia</i>	sand puff	Stomach and bowel ailments (roots and flowers)
<i>Achillea</i>	yarrow	Sore and bruise ointment (leaves, mashed); indigestion (roots, boiled)
<i>Argemone</i>	prickle poppy	Laxative (seeds, ground and boiled)
<i>Artemisia</i>	bud sagebrush	Laxative; venereal disease (whole plant, boiled)
<i>Asclepias</i>	milkweed	Wound dressing (roots, mashed)
<i>Aster</i>	(-canadensis)	Diuretic for venereal disease
<i>Castilleja</i>	painted-cup	Bowel ailments (roots)
<i>Chaenactis</i>	(-nevadensis)	Diarrhea (boiled into a tea)
<i>Chrysothamnus</i>	rabbitbrush	Sore muscles (whole plant, boiled for linament); colds, measles, smallpox, swellings (whole plant, boiled and drunk)
<i>Collinsea</i>	(-parviflora)	Sore ointment
<i>Commandra</i>	bastard toad-flax	Headaches (roots)
<i>Cowania</i>	cliffrose	Laxative (whole bush, boiled); measles, smallpox, sore eyes (whole plant, boiled)
<i>Enceliopsis</i>	red brush	Stomach disorders (made into tea)
<i>Ephedra</i>	(-nevadensis)	Kidney disorders (made into tea)
<i>Eriogonum</i>	silver plant	Stomach disorders (flower, boiled into tea)
<i>Ferula</i>	(-multifida)	Wound and bruise ointment (root, ground); horse distemper (roots, burned and inhaled by animal)
<i>Fritillaria</i>	tiger or brown lily	Unspecified ailment (bulbs and roots)
<i>Gilia</i>	(-gracilis)	Bruised or sore legs (poultice)
<i>Grindelia</i>	gumweed	Smallpox; coughs
<i>Hedysarum</i>	(-mackenzii)	Unspecified ailment (roots)
<i>Krynitzkia</i>	(-sericea)	Stomach ailments (roots)
<i>Lithospermum</i>	(-pilosum)	Diuretic (roots)
<i>Matricaria</i>	may-apple	Unspecified ailments
<i>Pentstemon</i>	(-palmeri)	Burn ointment (leaves, ground)
<i>Rumex</i>	(-mexicanus)	Cut and sore ointment (roots, mashed)
<i>Salix</i>	willow	Eye ailments (whole plant, burned)
<i>Salvia</i>	sage	Stomach disorders, blood tonic (tops, boiled into tea)
<i>Sisymbrium</i>	hedge-mustard	Unspecified ailments
<i>Symphoricarpos</i>	snowberry	Eye ailments (whole plant, boiled)
<i>Viola</i>	wild pansy	Unspecified horse ailments
<i>Welwitschia</i>	(-diffusa)	Emetic (boiled for tea)

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Sources: Chamberlin (1909, 1911); Steward (1938).

with native pharmaceuticals. In the traditional cultures, the treatment of serious illnesses was typically monopolized by religious specialists, or shamans. Only persons with special supernatural powers were felt to be capable of curing the gravely ill. Shamans often specialized in particular medical problems, such as snakebites, or had a more generalized practice. The charging of fees for services, which involved songs, expurgations, and at times trances, was common.

RELIGIOUS SIGNIFICANCE OF NATIVE FLORA AND FAUNA (2.2.2)

There is no strict dichotomy in traditional Native American cosmologies between human and non-human organic forms. All are infused with a similar spiritual energy which relates back to the time of creation. It is this spiritual essence which is the substantive property of all life, whereas species demarcation, as we would phrase it, is merely a secondary or formal property. This concept is basic to an understanding of Native American views of the universe. It accounts for the interchangeability of human and animal forms in mystic times, and their continuing ability to interact with and influence one another in daily life.

When Animals Were People

Animals play a central role in Native American religious accounts of the creation of the universe, earth, the natural environment, and humans. The creation myths of American Indians refer to the time When Animals Were People. They typically begin with a supreme being such as the Southern Paiute "Ocean Woman" (Laird, 1976:148-149), the Washo "Creation Woman" (Downs, 1966:60) or the Ute "He-She" Great Spirit (Jefferson, Delany, and Thompson, 1972:64), a bisexual god. These supreme beings provide the raw materials for the formation of the planet, but generally leave the primary roles of creation to animals, which are often portrayed as their agents or offspring. Unlike the more universal religions, supreme gods remain comparatively remote from the daily lives of individuals, and are seldom the objects of direct communication or prayer. Animals, in contrast, are the guardians of the spirit-world and the primary intermediaries between humans and the unknown.

Animals in mystic times had their own languages, societies, and supernatural powers, and were the immediate precursors of Indians. Each Native American culture in the Great Basin has hundreds of myths which recount the formation of the natural environment, the afterworld, and humans by animals. The most prominent figures in this respect are Wolf and Coyote. Among the Kaibab Southern Paiute, for example, Wolf is referred to as "people's father" for his role in creating land and animals (Kelly, 1964: 133). Coyote, often portrayed as his brother, is credited with the introduction of sexual intercourse by the Northern Paiute (Kelly, 1938:371), and with fathering the human race (by copulating with Louse, daughter of Ocean Woman) by the Chemehuevi branch of Southern Paiutes (Laird, 1976:149-152). Although their roles vary from tribe to tribe, Wolf and Coyote are universally recognized as supreme supernatural creatures among Numic-speaking peoples. Wolf typically assumes a powerful, business-like, and asexual posture, creating earth, its creatures, and the afterworld (Jorgensen, 1913). Coyote, although equally powerful and often fearsome, is more subject to "human" passions, and at times is cast in the role of trickster.

Several other animal species play important roles in the creation of specific environmental features or in instructing humans how to survive and behave morally.

Prominent in this respect are Bear, Mountain Sheep, Deer, Rabbit, Beaver, Fox, Eagle, Skunk, Porcupine, Sagehen, Hawk, Antelope, Bat, Dove, Tortoise, Rat, Weasel, Mountain Lion, Dove, Frog, Gila Monster, and Rattlesnake (see also Downs, 1961; Kelly, 1938; Kroeber, 1901; Lowie, 1909, 1924; Malouf and Smith, 1947; Mason, 1910; Palmer, 1946; Reagan, 1935; Steward, 1943). Literally all animal forms which appeared in the aboriginal environments of Nevada/Utah Indians are portrayed in myth and folklore.

A central element in Native American cosmologies is the facility with which the formal properties of human and non-human or species statuses are regularly crossed. The central character of a particular tale may assume several different forms in a single adventure. In the Southern Paiute "Sky Brothers" myth, for example, protagonists alternate between human, bat, and deer forms (Laird, 1976:210-211). Similarly, in a creation myth of the Northern Paiute, a woman encounters a Beaver who is an Indian, the Beaver's sister Gopher, and finally Rat who is simultaneously a brother to Beaver and Gopher and the woman's own uncle (Kelly, 1938:365-368). Such mutations of form, while somewhat bewildering to non-Indians, are central to an understanding of past and present relationships between Native Americans and native fauna.

Animal-Spirits and Anthropomorphic Creatures

Although the creative acts and exploits of native fauna in mystic times are recognized to have occurred in the distant past, the contemporary descendants of these creatures are still imbued with spiritual energy and supernatural power. Animals continue to serve as the primary intermediaries between humans and the unknown. They are the ultimate source of supernatural power in traditional Great Basin Indian religions. This power may be directed against humans for the redress of wrongs, or may be transferred by animals to selected persons for the benefit of mankind. In the first instance, animal or anthropomorphic creatures are viewed as spiritual beings which must be placated or avoided. In the second instance, power and curing knowledge provided by animal-spirits to shamans and selected individuals allows human manipulation of an otherwise harsh and unpredictable environment.

All animals portrayed in the myths of Great Basin Indians were felt to be sources of supernatural power with the ability to avenge themselves on humans for mistreatment. Disposing of game animal remains, especially the bones, without proper respect could cause illness or other dire consequences (Downs, 1966:29). The Northern Paiute, for example, among whom Porcupine was regarded as the architect of snowstorms, took care when burying the entrails not to offend this animal (Wheat, 1967). Anthropomorphic creatures are also a potential source of harm. One of these, the Water Baby, appears in varying forms in all Nevada/Utah Indian groups (Downs, 1966:62; Park, 1934:100; Kelly, 1964:138; Jefferson, Delaney, and Thompson, 1972:74-75). This nymph- or fish-like creature is usually described as 2-3 ft (60-90 c) tall with long hair, mustache, and clammy reptilian skin. It occupies all water bodies (including modern irrigation ditches), and attempts to woo unsuspecting humans, particularly children, to the water's edge for drowning. A seemingly dry-land variant of this creature, Mountain Man, is noted for the Goshute (Malouf, 1974:54). The Ute additionally recognize a terrestrial variant with fish-scales and protruding red eyes which captures and eats children. Anthropomorphic creatures which can frustrate or thwart humans are commonplace. Among the Southern Paiute, for example, a creature appearing alternately as a man, dog, or

two large deer was felt to own the Kaibab plateau, and to ruin the luck of individual deer-hunters if offended (Kelly, 1964:139). Other animals, such as the Owl (Kelly, 1964:139) or Meadowlark and Coyote (Malouf, 1974:57) are felt to bear messages of death with their cries.

Shamanism and Power Acquisition

Perhaps the most important area of supernatural interaction between animals and humans occurs in the transfer of curing and other powers to shamans. It is here that the interchangeability and intimacy of human and animal forms had greatest impact in daily life. Shamans are religious specialists of either sex who have acquired supernatural powers from an animal-spirit. The pattern of power acquisition is consistent among Great Basin Indians (Downs, 1966:56-57; Park, 1934; Malouf, 1974:81-82; Kelly, 1939; Laird, 1976:32-38). Adult men and women who are to become shamans receive a number of visitations from a particular animal-spirit in dreams or visions. This animal-spirit or "familiar" instructs the chosen person to acquire items of curing paraphernalia, and teaches the novice through songs the arts of healing. The status of the shaman is thus involuntary. Those who resist a calling may suffer a series of illnesses, or even death.

Sponsor animal-spirits or familiars continue to visit shamans in dreams throughout life, and are regularly called upon during curing rituals for supernatural power. This process is often mediated by trance. So intimate is the relationship between shamans and their familiars that religious specialists are often felt to acquire the personality characteristics of their animal sponsors. A shaman who has the powerful Bear for a familiar, for example, may at times exhibit superhuman strength (Downs, 1966:58; Laird, 1976:37-38). This interchangeability in some cases is believed to reach the extreme of actual physical change. Underhill (1965:91) records a Native American report of a Northern Paiute shaman turning himself into a bear. Similarly, Downs (1966:61) notes the Washo belief that selected persons may turn themselves into coyotes and harm others (i.e., assume the carnivorous tendencies of their familiar). The nature of a shaman's familiar often predisposed the curer toward treatment of specific types of illnesses. Those with Rattlesnake as a familiar, for example, were thought to be immune to snake venom and uniquely qualified for successful treatment of bites (Downs 1966:58; Park 1934:101, 107).

The products of certain animals were regularly utilized to make curing instruments. Prominent in this respect are eagle feathers or entire eagle skins, which were universally used in the Great Basin to embellish the curing sticks or wands used by shamans during the medicinal ritual (Downs, 1966:57; Malouf, 1974:52; Laird, 1976:115; Park, 1934:99). The important role played by Eagle in the manufacture of religious paraphernalia led to the general recognition of this bird as a sacred animal among Nevada/Utah Indians. Also regularly utilized were deer ears, claws, and hooves for curing rattles (Wheat, 1967:20; Park, 1934:99).

Certain animal-spirits or familiars were regarded as more powerful or were viewed with more favor than others. While Coyote and Wolf were extremely powerful familiars, there was always an underlying fear that the shamans which they sponsored could assume the carnivorous nature of these animals and present a danger to society. In contrast, Antelope and Deer, themselves often portrayed as shamans in myth, were simultaneously powerful and friendly to humans. There is evidence to suggest that anthropomorphic creatures could also serve as shaman's

familiars among some Great Basin groups. Park (1934:101) notes that this supernatural power may be derived from Water Babies among the Northern Paiute, while Malouf (1974:82) records a similar role for the diminutive Mountain Man among the Goshute.

Supernatural Aspects of the Hunt

These cultures which accord animals such a central place in their cosmological systems could regularly exploit them for subsistence through the general Great Basin Indian belief that game animals voluntarily donate their lives for the benefit of mankind. The only payment demanded by animals in return is proper treatment, respect, and appreciation for this sacrifice (Downs, 1966:30). It is perhaps more understandable, then, that in times past the hunting of large game animals was surrounded by an aura of ritual sacredness.

This pattern was particularly marked in the aboriginal communal drives of the pronghorn antelope, which were directed by a special antelope shaman (Steward, 1938:34-35; Steward and Wheeler-Voeglin, 1974:51; Park, 1934:108-109; Underhill, 1961; Downs, 1966:31). The antelope shaman received special supernatural powers in dreams or visions which enabled him to locate suitable herds and to charm them into docility. One to several days of ritual prior to a hunt were required to capture the souls of the herd. So powerful was this activity that the death of a hunter during the campaign was often expected. Among the Washo, no special antelope shaman is recorded (Downs, 1966:32). Rather, any hunter who received a prophetic dream regarding the location of antelope herds may lead a communal drive. Communal deer hunts along migration trails during the spring and fall involved similar ritual charming by deer shamans in some areas of the Great Basin (Steward, 1938:36). The hunting of elk was also marked by supernatural ritual among the Goshute (Malouf, 1974:79).

Supernatural means for increasing hunting success were also available to the average person on an individual basis. Favors could be requested directly from the spirit-world at special sites, such as caves and rock outcroppings, where supernatural power was known to reside (Malouf, 1974:81-82; Park, 1934:103). These sites were extremely sacred and dangerous, however, and only the brave could withstand the trial of spending the night there.

Witchcraft

Just as shamans possessed supernatural powers to cure the sick, so could they direct this energy for selfish and evil purposes. Witchcraft by shamans was regarded as a primary cause of illness (Park, 1934:110-111; Downs, 1966:57; Whiting, 1950). The malevolent goals of an evil shaman were accomplished primarily through psychic activity, i.e., by willing that a person will fall ill. In some cases, however, a poisonous snake or lizard may be willed by the shaman to attack the chosen victim. The only cure available to a bewitched person is the counter-magic of a powerful shaman. Persons suspected of witchcraft were typically executed.

Persistence of Native American Religious Beliefs

There are several reasons why Christianity has been unsuccessful in obliterating traditional Native American religious beliefs. First, it is based upon a single

omnipotent creator deity, with only a limited number of lesser deities (the Trinity). The supreme Christian deity is more comparable to Ocean Woman, the Great Spirit, or the Sun in Great Basin Indian religions than it is to powerful animal-spirits. The Holy Ghost and Messiah, as the spirit and messenger of the supreme being, are more parallel to Wolf or Coyote as purveyors of wisdom and foci of human communication with the cosmos. Still, the fit is imperfect, and simple replacement of Native American gods and demi-gods with Christian ones is impossible. A common method of religious integration, therefore, was to simply add Christian deities to the existing traditional pantheon. The basic Christian demand for exclusiveness with respect to recognition of the supreme being holds little appeal or logic for followers of polytheistic religions.

A second feature which favors the persistence of Native American religious beliefs is the differential reckoning of sacred space and sacred time. Christian teachings are based upon a chronological sequence of events, the most significant of which occurred long ago among unlike people in a very distant holy land. The Native American holy ground which surrounds him has little relevance or definition in the new Faith. More importantly, the vertical reckoning of sacred time in Christianity generally limits human contact with the deity to one-way communications, i.e., prayer. More substantive contact with the deity in another world also carries a chronological prerequisite, namely death, and is not guaranteed. Visions, a central communication element in Native American religions, are prominent in Christian legends of past events, but play little role or are accorded less credibility by major Christian sects in the present. The horizontal reckoning of sacred time, an essential Native American vehicle for dealing with the exigencies of everyday life, is entirely lacking. Whereas traditional animal-spirits offer power for immediate problems, Christianity offers salvation--a reward automatically guaranteed to all but witches in Great Basin Indian religions.

Third, Christianity reinforces rather than discourages traditional beliefs regarding ghosts or the spirits of the dead. Scriptures and communiques of the Church are replete with references to evil spirits, demons, witchcraft, and exorcism. Moreover, there is presently a renewed interest in and implied credibility for such supernatural phenomena in the larger American society. These notions are part of the persistent traditional belief systems of both Western European and Native American cultures.

A fourth reason for the limited success of Christianity as an acculturating agent is the rise and subsequent popularity of the Native American Church, or Peyote Cult. The Native American Church incorporates a number of Christian features, such as its congregational nature, and selected song and prayer elements. While sometimes regarded as a syncretistic movement, the Church is firmly based in Indian traditional religion. The element so overtly lacking in Christianity, namely horizontal reckoning of sacred time, is restored by the Peyote Cult. In prayer meetings, the journey to the spirit-world is achieved by members through visions facilitated by the hallucinogenic properties of peyote. As in aboriginal times, Native Americans may consult the spirits directly for the achievement of everyday health and well-being.

The Bear Dance

A spring festival dance honoring the animal-spirit Bear was an important ritual event in aboriginal times for the Ute Indians (Reagan, 1930; Reed, 1876; Steward,

1932, 1938:228). A form of the Bear Dance continues to be held on Ute reservations to the present day.

Several reports on the ceremony and its ritual significance have been made, but few aboriginal performances were observed and described in early historic times. The eye-witness account of Reed in 1893 is a notable exception (Reed, 1896). His observations occurred sufficiently early in the reservation period to capture the full cultural import of the ritual. According to Reed, a participant in the event, the Bear Dance is a sacred rite which underscores and renews the relationship of bears and humans established at the time When Animals Were People:

- o The Utes believe that their primal ancestors were bears; after these came a race of Indians, who, on dying, were changed to bears, and as bears they roamed in the forests and mountains until they died, when they went to the future land and lived with the shades, preserving the forms of bears, but having human wisdom and participating with the Indians in the pleasures of immortality. It is believed that this transmigration ceased long ago, but the bears of the present are believed to be descendants of the Ute bears of old, and are therefore related to the Indians...They believe that bears possess wonderful magic power... They believe that the bears are fully cognizant of the relationship existing between themselves and the Utes, and their ceremony of the Bear dance, being a form of animal worship, assists in strengthening this friendship...one of the purposes of the dance is to assist the bears to recover from hibernation, to find food, to choose mates, and to cast the film of blindness from their eyes. Some of the other motives of the ceremonies are to charm the dancers from danger of death from bears, to enable the Indians to send messages to their dead friends who dwell in the land of immortality, and one or two minor ceremonies are performed usually for the purpose of healing certain forms of sickness (1896:238).

The entire ceremony thus symbolizes the sacred association of humans and bears. It is held in March, the time when bears emerge from hibernation, and formerly lasted four days and one night, a time period equated with that required for bears to fully recover from the winter's inactivity. The dance was held in a specially-constructed circular, walled enclosure, 100-150 ft (30-45 m) in diameter, which symbolized a bear cave. The ceremonial structure was considered sacred ground for the duration of the rites. It was believed that bear and Indian members of the afterworld simultaneously prepared for their own Bear-spirit dance, and sent messengers to mortal hibernating bears to advise them of their imminent awakening. The dancing itself, held daily for the duration of the ceremony, was performed to the accompaniment of a select group of musicians and singers. Women and men occupied opposite sides of the ceremonial cave and danced in unison facing one another in parallel rows. Dance partners were selected by women, after the manner in which female bears select their mates. Accordingly, much courting occurred in the context of the ritual. The festive nature of the dance was regularly interrupted by periods of silence and devotion, wherein the dance chief (typically a shaman) and singers participated in incantations to the afterworld. The Bear Dance performance served to secure the supernatural power of spirit-bears, to send messages to the dead, and to protect dance participants from predation by bears on earth.

It is interesting to compare the 1893 observations of Reed (1896) with the eye-witness account of Steward (1932) made at the Uintah Reservation in 1931. The

Bear Dance had, by that time, attracted non-Indian tourists, and lacked the religious incantations of earlier times. Steward, who was apparently unfamiliar with Reed's (1896) earlier paper, described the festivities as largely a social affair or "mating dance" which had lost all traditional religious content. He thus failed to recognize the traditional symbolic significance of female behavior during the 1931 Bear Dance. Steward interpreted the aggressive role played by women in selecting dance partners as curious, and a possible argument against the "universal law" of male dominance (1932:272-272). This stylized behavior is a ritual representation of bear mating patterns.

Steward's (1932) description also underscores the importance of outside restrictions on Native American religious activities. The number of Bear Dances regularly held and attended by all Utes at various reservations, for example, was actively limited by governmental agents, who viewed such time expenditures by Indians as "unproductive." Similarly, all-night dancing (a central feature on the final night of the ritual) was prohibited by government regulation on the ground that liquor importation could not be controlled (Steward, 1932:272). It is difficult to imagine that Utes in 1931, many of whom participated as children or young adults in Bear Dances such as that observed by Reed (1896) some forty years before, had forgotten the religious and symbolic content of the ceremony. It is more likely that traditional rituals were performed privately, at times when the general religious intolerance and mockery of aboriginal beliefs by outsiders could not serve as inhibiting factors. Interestingly, Steward notes that the 1931 Bear Dance, scheduled to end on a Sunday, was extended one day "because they preferred to postpone their feast until after Sunday when the white people had left" (1932:271).

Ritual Aspects of Native Flora

Native plants, when compared to animals, are clearly secondary in supernatural importance or connotation in Great Basin Indian religions. Several important features, however, must be noted.

In mythology, plants are seldom personified, although there are some instances in which bushes and shrubs respond verbally to questions (Laird, 1976:104). Washo tradition holds that Creation Woman formed this and neighboring tribes from cattail (*Typha*) seeds (Downs, 1966:60). More typically, however, mythological references to flora refer to the sacred origin of important subsistence foods. Among the Northern Paiute, for example, Coyote is credited with the introduction of pine-nuts (Wheat, 1967:31).

Due to its importance for the economic survival of Great Basin Indians, the fall pine-nut harvest was associated with supernatural power and ritual. Among the Northern Paiute an annual prayer dance was held several weeks before the ripening of pine-nuts to ensure a good crop (Wheat, 1967:12-13). This sacred rite involved the dispatching in August of a scout and a specially-appointed group of religious pilgrims (including a shaman) to a promising pinyon grove for prayer and the collection of immature pinecones. Nuts from these cones were gathered and carried back to camp for ritual consumption. The ceremony lasted for four or five days, and consisted of prayers for rain in the form of songs and dances. A sagebrush (*Artemisia*) branch, itself regarded as containing the supernatural power to cause rain, was employed by a shaman during the ritual. The pinyon harvest among the Washo was marked by ceremonies during the first four days of gathering, again to

ensure a good crop (Downs, 1966:23). The religious observances included ritual bathing, fasting, and evening songs and round dances. Plants, like animals, had the supernatural power to avenge themselves on humans if offended. Violation of the taboo against mistreating pine-nuts or pinyon trees resulted in illness and misfortune (Downs, 1966:56).

Other plants were regarded by some Great Basin Indians as containing supernatural power which could be utilized by humans to achieve personal goals. The Jimson weed, a hallucinogen, was approached for its power to locate misplaced articles or to identify a person causing misfortune (Laird, 1976:39). The ritual required an individual to verbally address the plant, apologize for disturbing it, remove the eastern root, and either chew the root or make it into a drink. The resultant visions experienced by the recipient supplied the desired information. In addition, the leaves of certain plants, when rubbed on the body, were felt to contain the supernatural power to ensure hunting luck (Downs, 1966:35).

One of the most important native plants in terms of ritual or religious significance is wild tobacco (Nicotiana attenuata). It was almost universally used by Native American shamans in curing and other prayer rituals, and its smoking was regarded as a sacred or semi-sacred act (Downs, 1966:56; Park, 1934:105; Steward, 1933:319-320; Chamberlin, 1911:3435; Reed, 1896:243). Wild tobacco is an essential ingredient in the shaman's religious paraphernalia which is gathered under the instructions of an animal-spirit or familiar. It is utilized in all curing rituals by these religious specialists. Wild tobacco is also employed in important ceremonials such as the Bear Dance, where "sacred smoke" is utilized to contact the dead and bear-spirits in the after world.

A second hallucinogen, peyote (Lophophora williamsii), is associated with a historic and contemporary religious movement called the Peyote Cult or Native American Church (Stewart, 1944; Hayes, 1940; Malouf, 1942; Jefferson, Delaney, and Thompson, 1971:65; La Barre, 1938). The movement began among Plains Indians, and diffused to Nevada and Utah in the 1920s and 1930s. Membership in this congregational church is widespread, and is associated with the maintenance of Indian identity and culture. While certain elements of Christianity have been incorporated, the basic doctrines and rituals are distinctly Native American in origin. The primary purpose of religious meetings is the physical and spiritual purification of members through the power of Peyote (a plant-spirit) and prayer.

CONTEMPORARY SIGNIFICANCE OF NATIVE FLORA AND FAUNA (2.2.3)

A complete assessment of contemporary Native American uses of and concerns for native flora and fauna in Nevada/Utah can be gained only through the gathering of data from the Indians themselves. The general discussion which follows is based largely upon ethnographic studies undertaken for environmental statements in other areas and logical conclusions which may be drawn from the existing literature.

The Question of Cultural Persistence

The first question which must be addressed is whether Native American environmental concerns simply mirror those of the broader citizenry, or whether their traditional heritage continues to foster a culturally distinct way of perceiving

flora and fauna. A view expressed by anthropologists early in this century was that American Indians were totally acculturated to the dominant society, and that only a few vestiges of the old ways remained. Such views have been expressed today by missionaries or governmental agencies who perceive themselves as guardians of the Indian community or agents of change. Assertions such as the following are commonplace: "About the only remaining facets of Indian culture are the small amount of beadwork being done by a few and the native tongue spoken by the majority of residents" (USDC, 1974:322).

The well-established fact that language and cultural perception go hand in hand should in itself draw into question the total Indian assimilation. The persistence of native languages is all the more remarkable when one considers their lengthy prohibition in compulsory government schools. Until recently, American Indian communities themselves were promulgators of the myth of acculturation. In the face of severe governmental restrictions on the speaking of native languages and on the expression of traditional religious beliefs, a veneer of Anglo-Americanism was adopted. The core of distinctively Native American cultural elements remain today where they have been since pacification--in the private homes and ceremonies of reservation communities. While agents of change have unquestionably modified specific customs, beliefs, and traditional knowledge, the reservation Indian's perception of the universe is in many ways distinct from that of other Americans. New laws which guarantee religious freedom and the protection of cultural resources are encouraging the open expression of these traditional Native American concerns.

Contemporary Significance of Native Flora

The aboriginal lands of Nevada/Utah Indians have undergone considerable ecological change since first Anglo-American contact. Native grasses in many areas were destroyed by livestock and replaced with hardier species such as sagebrush. The diversion of surface and groundwater for private wells and irrigation increased the aridity of these regions, effectively eliminating species formerly used for manufacturing, food, and medicines, and laying vast surface areas open to erosion. These processes, along with the legal alienation of Native Americans from tribal lands, contributed to the gradual alteration of aboriginal patterns of interaction with native flora. Nevada/Utah Indians became dependent upon new food resources, such as those derived from agriculture and cattle-herding, and those available commercially through the vehicle of wage labor. Adoption of Anglo-American subsistence technology, firearms, clothing, cooking utensils, and containers discouraged the generational dissemination of knowledge in traditional crafts. Moreover, the introduction of modern medical facilities and commercial drugs greatly reduced the extent to which native flora were utilized for curing. Despite these obvious changes, traditional knowledge and traditional patterns of floral exploitation persist in contemporary Indian communities. These skills, typically in the hands and minds of tribal elders, are currently being revitalized as part of the growing national movement of Indian cultural pride. The survival of and access to native plants on which these activities depend has thus become an important Native American issue.

Basketry Plants. Of all the traditional crafts, basketmaking is undoubtedly the most difficult and most highly valued. Old baskets are typically found in all Indian homes, and have become family heirlooms over the generations (Downs, 1966:109). The bulk of these valuable pieces are currently in the hands of non-Indians in

museums, universities, private collections, and commercial outlets. Native American access to these artifacts for their own proposed or newly-formed tribal museums is a current source of debate. In most Great Basin Indian communities there are women elders who retain the traditional skills for producing a wide variety of aboriginal baskets, cradleboards, and other containers. In an effort to preserve these crafts, many reservations are promoting basketmaking classes for younger members of the tribes. This renewed interest not only preserves an area of traditional knowledge, but provides a source of commercial income for skilled artisans. The native plants which provide the raw materials for these products, however, often grow in areas where access is restricted, or are increasingly threatened by modern development. Many of these plants, such as the buffalo berry (*Shepherdia*), june berry (*Amelanchier*), service berry (*Amelanchier*), grasses (*Epicampas*), and mahogany tree (*Cercocarpus*), occur in foothill and higher elevations, and are not always generally available to Native Americans congregated in arid valley reserves. Perhaps the most important basketry plant in the Great Basin, the willow (*Salix*), is limited to well-watered areas which are themselves a vanishing resource. Other riparian flora utilized in basketmaking, such as *Juncus*, devil's claw (*Martynia*), and cottonwoods (*Populus*), are similarly threatened by increasing aridity and by the primary and secondary impacts of off-road vehicle use. In a recent ethnographic study, women of the Chemehuevi branch of Southern Paiutes complained of the difficulty in locating suitable basketry materials. One female elder remarked of devil's claw: "The plant likes sandy washes, and that is the place that the dune buggy people drive. You cannot have both in the same area" (Bean et al., 1978:6-38).

Medicinal Plants. The introduction of medicine based upon Western science has had a tremendous impact on traditional methods for the treatment of illnesses (see discussion of shamanism and peyote below). Modern doctors and medical facilities, however, are utilized by contemporary Indians primarily for traumatic injuries or serious ailments, when other remedies fail or are unavailable. The traditional pharmaceutical inventory of Great Basin Indians, outlined in Table 2.2-3, focused largely on the relief of common illnesses such as colds, sores, and digestive problems. Modern commercial preparations, while generally available, are often foregone by Native Americans in favor of teas and other medicines made from native plants which have been proven over the generations to produce desired results. As in the case of basketry materials, however, the decreasing availability of medicinal plants is a growing concern (cf. Bean et al., 1979a:8-8).

Food Plants. The plant food which was most important in the survival of aboriginal Great Basin populations, pinyon nuts, continues to be harvested annually by contemporary Nevada/Utah Indians (Downs 1966:86, 109; Freed and Freed, 1963:36; Clemmer; 1978; Wheat, 1958, 1967:29-39), and provides an important symbolic link with the past. Pinyon groves appear throughout the two-state area at elevations between 5,000 and 7,000 ft (1,500 and 2,100 m). In a recent survey by the U.S. Forest Service, Nevada Shoshones indicated a concern for the preservation of these groves, and for the maintenance of free access (USFS, 1978a:13, 19). Firewood, herbs, and other food plants are still collected by these peoples. Ute Indians of Utah urged that so-called roadless areas be maintained in their natural state: "The Ute Indians' lifestyle places increasing value on their cultural heritage and close association with the land" (USFS, 1978b:24-25). Wheat (1958, 1967:29-39) has described the persistence of aboriginal patterns of pine-nut harvesting for the

Northern Paiute. Similarly, Downs underscores the continuing relationship of Washo Indians with native flora:

- o Today, gathering is still very much a part of Washo life. Near every settlement, hidden under brush to keep it from the white who might laugh, is a lam, regularly used to grind pine nuts and occasional acorns. If a wet summer produces a large crop of wild mustard or pig weed, many Washo will turn out to gather the seeds. The pine nut hills are still full of Washo in the fall (1966:86).

Contemporary Significance of Native Fauna

Interview data for Native Americans in California and Arizona (and similar results are expected in Nevada and Utah) indicate a deep concern for the preservation and well-being of all native animal forms, from the largest mammals to the smallest reptiles and insects (cf. Bean et al., 1978; 1979a; 1979b). It is notable that the Utes of the Uintah and Ouray Reservation have established a tribal Fish and Game Department for the monitoring and protection of native fauna, and that mitigation for deferred Ute water rights to the Central Utah Project included the establishment of reservoirs for the propagation of waterfowl. The extent to which these concerns reflect the persistence of aboriginal notions about the sacred relationship between Indians and animals is difficult to assess. After years of religious intolerance, persecution, and often mockery by outsiders, Native Americans have tended to maintain an aura of secrecy regarding traditional ideas and activity. Evidence for both persistence and change in aboriginal cosmologies is available.

Shamanism, Modern Medicine, and Peyote. In aboriginal times, the role of shaman commanded the greatest power and respect in Great Basin Indian cultures. The brief period of Indian-Anglo wars saw the rise to prominence of several military chiefs who consolidated local bands into political units much larger than those which prevailed in the pre-contact period. Following pacification and the establishment of reservations, however, Indian war leaders were stripped of their power, leaving shamans once again in a dominant position. While shamans generally experienced an exaggeration of power in the early reservation period, several factors over the next century conspired to demote their status and, in some areas, to eliminate them altogether. Three factors will be briefly discussed here: (1) the inability of shamans to effectively control and eliminate new causes of misfortune in Indian communities, (2) the introduction of western medicine, and (3) the introduction of the Peyote Cult.

The period following the Anglo-Indian conflicts was one of cultural anomie for Native Americans. Extreme poverty, coupled with malnutrition and the introduction of new diseases placed an overwhelming burden on shamans to alleviate the suffering. Their inability to deal effectively with new diseases, such as smallpox and venereal diseases, cast doubt on their profession. Interestingly, it was not the ability of shamans to cure illness which was questioned, but rather their intentions. Witchcraft accusations against shamans became commonplace, and murders of such individuals were reported through the 1930s (Downs, 1966:99-101; Park, 1934:98). Shamans have continued to practice until modern times, but their ranks have not been replenished and have often disappeared with the death of remaining elderly curers (Freed and Freed, 1963:33-34).

The decline of shamanism is partially attributable to the usurpation of curing roles by modern medical doctors. These specialists had a greater familiarity with

and greater skills for the healing of diseases which were often introduced by their own culture. The dietary changes and psycho-social stresses imposed upon Native American populations have led to a syndrome of chronic health problems distinct from those of the aboriginal period when shamans held sway. Medical information on major health problems for approximately half of the Nevada reservations and colonies is available. These data are summarized in Table 2.2-4.

It is interesting to compare Table 2.2-4 with data for common aboriginal ailments contained in Table 2.2-3. Of the health problems affecting contemporary reservation Indians, only colds, arthritis, and digestive problems are consistently reported ailments from the pre-contact to modern period. Although little information is available on the types of serious or life-threatening conditions treated by shamans in prehistoric times, there is ample evidence to suggest that chronic health problems which affect Native Americans today are related to conditions of poverty and psychological stress. Otitis media and respiratory infections such as the common cold, pneumonia, strep throat, pharyngitis, and bronchitis, were undoubtedly commonplace during the aboriginal period when cold winters combined with frequent food shortages. Their persistence today as a major health problem points to poor housing and poor nutrition. Dietary changes from nutritious seeds, pine-nuts, greens, and fresh meat and fish to inexpensive commercial foods high in fats and carbohydrates undoubtedly contribute to the current incidence of hypertension, heart disease, diabetes, and obesity (Scotch and Scotch, 1963). Alcoholism and an extremely high incidence of lacerations, contusions, and fractures point to the innerdirected depression and hostility characteristic of modern oppressed ethnic enclaves. It was this same process of community internalization of aggression for misfortunes which led to witchcraft accusations against shamans (Leis, 1963).

The decline of shamanism is also importantly related to the usurpation of curing roles by the Peyote Cult movement. The Peyote Cult arrived in Nevada/Utah in the 1920s and 1930s at a time when shamans were falling into disfavor. These traditional religious specialists, as well as younger persons who would have themselves become shamans in the past, immediately sought leadership roles in the new cult. The traditional notion of curing through supernatural power derived from spirit-animals was transferred to a spirit-plant, Peyote. This nativistic church claims a broad membership among Nevada/Utah Indians. It is based upon abstinence from alcohol, and ritual purification through the induced visions and power of Peyote. It is typically regarded as a primary mechanism for combatting disease in Indian communities today (Jefferson, Delaney, and Thompson, 1972:65). Peyote in many respects provides a binding-pin between the old and the new ways:

- o To the Washo the changeover from the aboriginal religion to peyote is viewed as simply the addition of a new element of supernatural power provided to assist the Indian. The old patterns were not effective or needed in the new world. As one informant put it: "Them old doctors had to have a lot of power because the Indians didn't have (know) too much. But nowadays the white doctors have a lot of power and the Indian doesn't need his power anymore. But the peyote helps the white doctor take care of the Indians." It must be disheartening for the doctor in a modern hospital to realize that in the eyes of his Washo patients he is nothing more than a new and more powerful shaman assisted by peyote (Downs, 1966: 104).

Table 2.2-4. Major health problems reported
at 13 Nevada Indian reservations
and colonies.

MAJOR HEALTH PROBLEMS	NUMBER OF RESERVATIONS
Respiratory Infections	13
Alcoholism and Mental Health	13
Otitis Media	9
Traumatic Injuries	9
Diabetes	6
Skin Diseases	5
Hypertension and Heart Disease	5
Rheumatoid Arthritis	2
Digestive Ailments	2
Non-endocrine Obesity	1
Hepatitis	1
Prenatal Disease	1
Bacillary Dysentery	1

072-1

Source: Bureau of Indian Affairs,
Information Profiles of Indian
Reservations in Arizona, Nevada,
and Utah - 1978.

Anthropomorphic Creatures and Animal-Spirits

The partial acceptance of Christianity and/or the new transfer of power in the universe to Peyote has not eliminated traditional beliefs in the supernatural power of animals and other creatures. Modern references to the existence of Water Babies, for example, are commonplace (Downs, 1966:62; Park, 1934:100). The creature has adapted to contemporary conditions by occupying irrigation ditches, in addition to natural streams, ponds, and lakes. Their high mewing calls are said to be still heard at night, and the footprints of modern female Water Babies often show evidence of high-heels. The Washo fear that whites, ignorant of the powers of the Water Babies, may inadvertently catch one while fishing. Illness may result from thus insulting the creatures, or even from mocking them and speaking skeptically about their existence. The supernatural power of many other anthropomorphic figures portrayed in traditional mythologies persists today. Among the Washo, for example, the cave-home near Gardnerville, Nevada of a one-legged giant named Hanglwuiwui is still regarded as a dangerous place (Downs, 1966:61).

The supernatural power of animal-spirits, like shamanism, has been somewhat overshadowed by the power of the plant-spirit, Peyote. The persistence of witchcraft beliefs, however, is widespread in Native American communities. It is as if supernatural curing powers which benefit mankind have been transferred to Peyote, whereas supernatural powers acquired from more traditional sources are associated with evil acts. The notion that some persons can turn themselves into coyotes and harm others still finds adherents among the Washo (Downs, 1966:61). Ute Indians today continue to fear witchcraft by Navajos, and the spouses of Ute women who have intermarried with this tribe are often accused of casting evil spells (Jefferson, Delaney, and Thompson, 1972:74).

The Bear Dance, another symbolic remnant of the ancient supernatural relationship between animals and humans, is still celebrated annually at the Ute Uintah and Ouray Reservation (USDC, 1974:523).

Hunting and Fishing. Fish and game continue to make an important contribution to Native American subsistence. The Northern Paiute, for example, still gather for the annual spawning runs of the cui-ui sucker on the Truckee River (Wheat, 1967:60-64), and hunting is universally important among all Nevada/Utah Indians. In aboriginal times, the taking of game animals was a rite of passage from boyhood to manhood, and a central ingredient in masculine identity. Downs notes the persistence of this pattern: "Hunting virtually dominated the Washo man's image of himself. Even today to suggest that a man had no taste for hunting and preferred to remain in camp with the women is an oblique way of attacking his entire character" (1966:36).

Fish and game laws are regarded with disdain by modern Indians, who view the respectful taking of such animals as their natural right. The general sentiment of Nevada/Utah Native Americans is summarized nicely in this statement of Washo concerns:

- o Indian lands, in their minds, encompass all that once was Washo hunting territory. Federal and state authorities do not agree with this interpretation. Every fall, Washo men are arrested for violation of the game laws relating to deer hunting. Deer meat often is the margin between

eating and starvation even today, and the Washo feel they are unfairly treated. There are no exact figures on how much deer hunting still contributes to Washo subsistence, but in many families the lack of deer meat would be a serious hardship. More importantly, surrendering to white law would be a final denial of Washo heritage and subjugation to white society which has already taken so much from them (Downs, 1966:82).

Indian concerns for the welfare of native fauna and their natural right to exploit these food resources has recently become the subject of political action. The Northern Paiute of Pyramid Lake successfully concluded litigation with the State of Nevada over Truckee River water diversions to maintain tribal fisheries. Similarly, the Utes of the Uintah and Ouray Reservation withdrew from water agreements with the Central Utah Project over a dispute with the State Legislature concerning the extension of Indian hunting and fishing rights.

Conclusion

The intimate relationship of Nevada/Utah Indians with native flora and fauna is an ancient and persistent pattern. Despite the substantial modifications which have occurred in Native American cosmologies, spiritual and supernatural elements continue to color modern Indian perceptions of the universe and natural environment. There is a general belief that the white man has wantonly and indiscriminately taken more from the environment than he has replaced. The biological concept of endangered species is regarded as both tardy, and invalid. All life forms are seen as integral parts of a single living system, such that the endangerment of one threatens the well-being of all. Whereas in the past Native Americans have responded with sadness and apathy, modern and future trends point to aggressive resistance and protest where loss of perceived hunting or fishing rights or loss of natural environment is involved.

Native Americans residing in the area continue to exploit flora and fauna species and a variety of inorganic materials in the traditional manner. For many reservation Indians, hunting and gathering provide an important dietary supplement. Native flora are also collected for the production of traditional pharmaceuticals, and for craft materials. Both organic and inorganic substances are additionally utilized for religious purposes.

Culturally, Great Basin Indians have an intimate knowledge of the ecological adaptations of native species. Native flora and fauna are regularly exploited as a food source. Access to hunting and fishing areas is an especially sensitive issue among contemporary Native Americans (Downs, 1966; Wheat, 1967). In traditional religious belief, faunal species voluntarily donate their lives to Indians for food. They are additionally a source of materials, such as feathers, skins, and animal hooves for the production of sacred objects (Wheat, 1967; Park, 1934). As in aboriginal times, pinenuts are the most important flora resource. The annual harvests in mountain areas throughout Nevada/Utah provide an important cultural and symbolic link with the past (Downs, 1966; Freed and Freed, 1963; Wheat, 1958, 1967) as well as food and a commercial product. The distribution of pinyon groves in the two-state area is illustrated in Figure 2.2-2. Pinyon groves are generally found in areas above 5,000 ft in altitude in northern latitudes, and above 6,000 ft in southern latitudes of the deployment area (Steward, 1938; Tueller et al., 1979). Pinyon groves are also important environments for game animals.

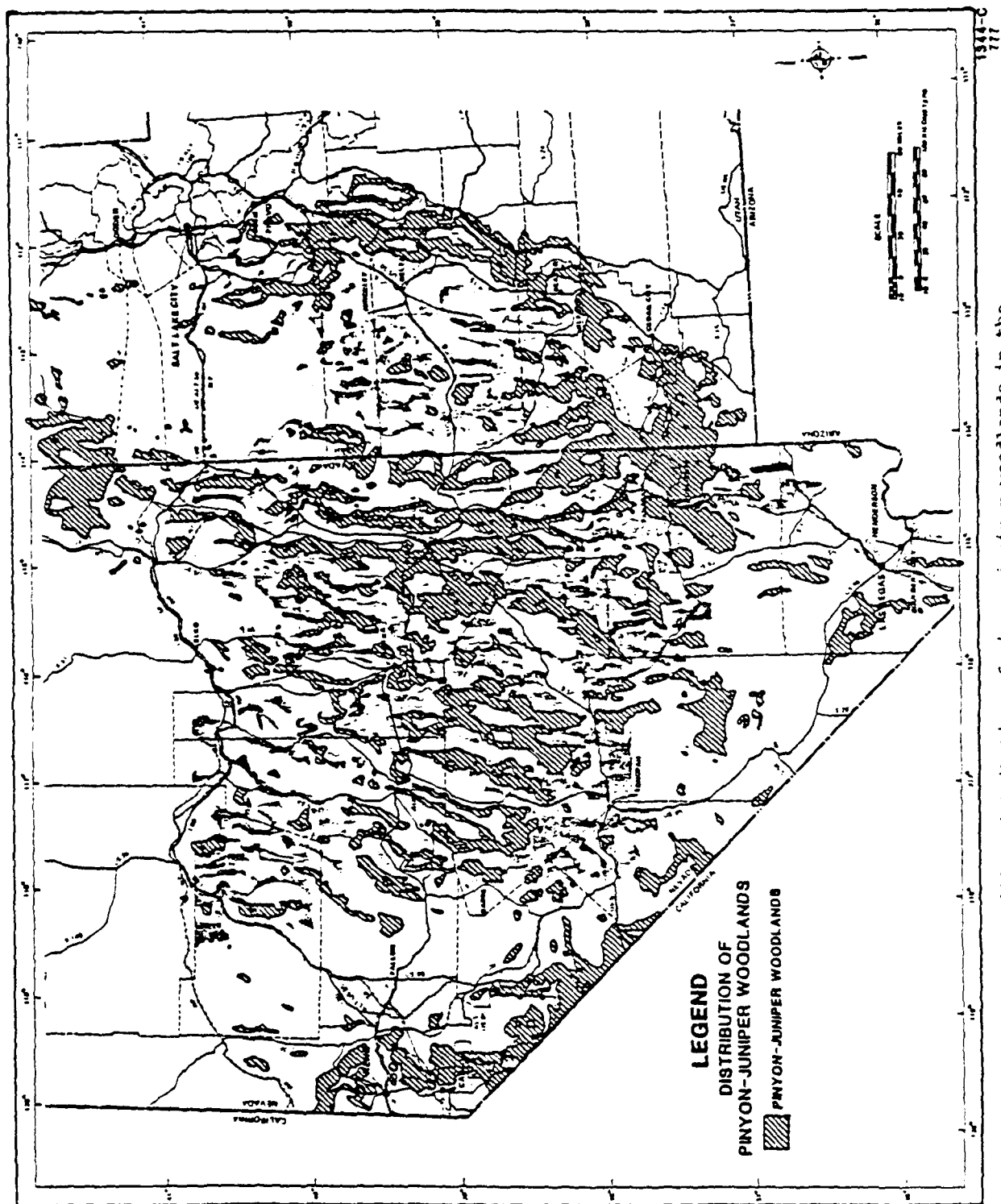


Figure 2.2-2: Distribution of pinyon-juniper woodlands in the

Native flora are also exploited for medicinal purposes. Aboriginally, over 500 flora species were utilized for the treatment of common illnesses (Train, Henrichs, and Archer, 1941). Some of these plants continue to be gathered today, and are often regarded as superior to modern pharmaceuticals (Smith, 1972). Willow, *Juncus*, devil's claw, and other riparian species are also collected by Native American artisans for basket-making (Kelly, 1964; Bean et al, 1978). These traditional crafts not only provide an important link with the past, but support a number of skilled craftpersons with supplementary incomes (Downs, 1966; Wheat, 1967).

Certain types of mineral deposits were regularly exploited in aboriginal times for the production of stone tools, pottery vessels, and substances which were imbued with supernatural power. Since these deposits have little or no monetary value in the modern marketplace, their significance in traditional Native American cultures is often overlooked.

Pottery made in the traditional manner by contemporary Indian craftpersons requires the use of special clays for vessels and decorative paint and glazes, and of special tempering materials such as mica or quartzite. These deposits typically have a very limited distribution within the radius of existing communities (Bean et al., 1978). Their preservation is importantly linked to the cultural maintenance of traditional crafts.

Special red clays, still mined today, have, in traditional Great Basin Indian belief, special properties which provide individuals with protection from injury and from evil spirits (Freed and Freed, 1963; Kelly, 1964; Downs, 1966; Wheat, 1967). White clays play an important role in traditional curing ceremonies, and continue to be utilized for medicinal purposes (Park, 1934; Smith, 1972).

Other materials, such as quartz crystals and specularite, have sacred connotations due to their perceived value in warding off evil spirits (Steward, 1941).

While the extant ethnographic literature contains much information on the types of gathering and hunting activities which continue to play an important role in cultural persistence, specific locational data on important resource types with respect to the study area are currently unavailable. A number of gathering and hunting areas which are exploited and valued by contemporary Native Americans have been recorded in field investigations at Indian reservations and colonies. These data are currently being analyzed.

2.3 GREAT BASIN SACRED AREAS

In Great Basin Indian religions, the concept of sacredness is associated with supernatural power derived from the spirit-world. All such supernatural power originates from the events and personages linked with Creation.

Native American and Western religions differ fundamentally in their basic perceptions of the universe. Sacredness in all cosmologies has both temporal and spatial attributes. In the Judeo-Christian traditions, sacred time is reckoned chronologically. Supernatural beings are accorded significance for their seniority in a series of sacred events which are not only recorded, but reenacted or celebrated by the living in annual calendars. Sacred space in these universal religions is

associated with specific sites where sacred events occurred in the past, with icons which symbolize these events in rituals, and with structures where such rituals are held.

In Great Basin Indian religions, sacred time is associated with the period When Animals Were People. In sharp contrast to Western thought, sacred time is reckoned horizontally rather than vertically. That is, the pathway from current to primordial times is regularly traversed in dreams and visions, such that distinctions between past and present are irrelevant or nonexistent. The ancient spirit-world is alive and ubiquitous.

For Native Americans, sacred space is wherever spiritual energy resides. In the broadest sense, the entire aboriginal territory of each tribal group is sacred, since the physiographic features of the environment were created during mystic times and contain the spirits of creator figures and their descendants. One often hears the phrase: "The whole area is sacred; the whole land is our church." Some spirits range freely within this territory, and cannot be identified with particular sites. Others make their homes at specific locations, such as mountain peaks, caves, rock outcroppings, or springs. These areas, when revealed by Native Americans, can be mapped as permanent sacred sites. Space may also be deemed sacred on a temporary basis. For example, sites utilized for rituals in which communication with the spirit-world takes place, such as the Bear Dance or modern Peyote Cult meetings, are considered sacred only for the duration of the ceremony. Sacredness may also attach itself to the vehicles of communication with the spirit-world. Plants such as native tobacco, peyote, or Jimson weed may be so regarded. Similarly, curing wands and the entire inventory of shamanistic paraphernalia are sacred objects imbued with supernatural power due to their use in soliciting the aid of animal-spirits. The fact that eagle feathers were a necessary embellishment of shamanistic curing wands diffused sacred status to the bird itself.

In summary, Great Basin Indian notions of sacred time refer to a consistent spirit-world and living universe where past, present, and future are one. Sacred space may be defined as all that is circumscribed by aboriginal boundaries, or it may be further delimited to general areas or specific sites. This sacred quality may be timeless or merely temporary. And finally, sacred status may be attached to special phenomena, artifacts, and species. In all of these cases, the essential association of sacredness with the supernatural power of the spirit-world is expressed.

PROBLEMS IN THE IDENTIFICATION OF SACRED AREAS (2.3.1)

In Native American cultures, knowledge of sacred areas is passed from generation to generation through the performance of important rituals and the retelling of myths, legends, revelations, and personal experiences. Religious traditions are strictly oral. Only certain forms of rock art may be regarded as scriptures, but the meanings of these symbolic representations are themselves a component of traditional lore. This privileged information was in the past a birthright of all tribal members, but was disseminated on a more selective basis, or not at all, to outsiders. The policy of exclusiveness in traditional knowledge became a cornerstone of Indian relations with Anglo-Americans from the period of pacification to the present day.

Native American Reticence

The political subordination of Indians in the 19th Century by Whites, the loss of sovereignty over sacred traditional lands, and the religious intolerance expressed by outsiders all contributed to a general Native American moratorium on public ritual and oratory. A strategy for cultural survival based upon reticence and the clandestine persistence of traditional knowledge and ritual was rapidly developed. Laws were passed by the federal government which were deliberately designed to restrict the practice of traditional rites, and thereby to bring Indians into firmer political and cultural control. Colorful ceremonies which formerly contained sacred rituals quickly attracted non-Indian tourists in search of the "romantic" and "quaint." Native Americans adapted by charging admissions to these entertainment-seekers, and by removing sacred aspects of the ceremonies from public view. In addition to mockery by outsiders and the fear of government reprisals, a third incentive for publically downplaying the importance of traditional religious beliefs was provided by missionaries. Indians on the brink of starvation were quick to learn that public participation in Christian rituals brought immediate tangible rewards in the form of food, clothing, and technical and medical aid.

Anthropologists who worked with Great Basin Indians earlier in the century tried to unravel the mystery of traditional religious systems. These scholars often won the confidence of Native Americans, and began to record the mythology of aboriginal cultures and the spiritual basis of native shamanism. As outsiders, however, they were seldom entrusted with definitive information on the most sacred aspects of Indian religions. An anthropologist may be told, for example, the reason why a particular type of area or site, such as a cave, was sacred, but its actual location was not revealed. When such information was provided scholars, they often would not, out of respect for their Indian informants, make these data part of the published literature. Thus, for example, we read in Park's (1924:102) article on shamanism that the Northern Paiute or Paviotso have eight sacred caves in their territory at which visions may be acquired, but these sites are not identified. Scholars commonly joined the conspiracy of silence.

The reluctance of Native Americans to reveal the location of sacred sites is also motivated by fears that such areas will be desecrated or destroyed. These fears are certainly justified by past history. Countless graveyards, petroglyphs, and archaeological sites, for example, when their locations have become public knowledge, have been pilfered and obliterated by vandals and treasure-seekers. The senseless loss of such sites arouses not only sadness and anger in Native American communities, but apprehension and fear as well, lest the spirits residing in these places become offended and cause harm to the living. The policy of silence in sacred matters is thereby reinforced.

Loss of Cultural Information

The very nature of oral tradition makes it susceptible to information loss over a number of generations. This is all the more true where, as in the case of Native Americans, public participation in traditional religious ritual and oratory was severely restricted, and new cosmologies openly competed with the old. Among contemporary Indians, knowledge of aboriginal tribal lore and religion is generally commensurate with advanced age. The death of tribal elders has been accompanied by an attrition of traditional knowledge. Information on the precise location of

sacred sites has thus often been lost. Native Americans commonly respond: "I know there are such sites, but only the shamans know where they were," or "I only wish I had listened to my grandfather more closely; I had no idea when I was young how important that information would be today." Where such cultural information loss has occurred, contemporary Native American concerns for these sites and areas are sometimes exaggerated rather than diminished. That is, if an important burial ground or ritual cave is known to exist somewhere within a large area such as a mountain range, the fear that this sacred site may be discovered by outsiders and inadvertently or deliberately destroyed is thereby increased.

Contemporary Native American Input

In recent times, the old policy of silence on sacred matters has been somewhat relaxed. Two factors seem to have encouraged this trend: (1) new federal and state legislation regarding religious freedom and the protection of cultural resources, and (2) the national movement for Indian pride and cultural awareness. Recent legislation guarantees Native Americans the freedom to express their traditional religious beliefs publically without fear of legal reprisals. This has encouraged a cultural renaissance on all Indian reservations. The further requirement that cultural resources such as sacred areas are entitled to protection and preservation under the law has provided a unique opportunity for open discussion of traditional religious concerns in ethnographic interviews and at public hearings.

The voicing of concerns by Native Americans for sacred or culturally significant sites has taken many persons by surprise. Religious beliefs which were held in confidence for generations were often assumed by outsiders to have disappeared long ago. The legitimacy of Indian religious arguments has been sometimes questioned on this basis, and on the ground that (for reasons noted above) little corroborating evidence for the existence of such sites may be found in the extant literature. Schedule interruptions and project delays resulting from differences of opinion on the sacred or cultural resources has in some instances led to ill feelings between the Indian and non-Indian communities.

Under present environmental laws, Native American concerns are viewed as valid and legitimate claims based upon persistent cultural values and beliefs. In many cases, these claims represent new data to the anthropologist as well as to the general public. The extant literature on Great Basin Indian sacred beliefs is, in and of itself, inadequate to identify and locate specific sacred sites and areas which are of concern to contemporary Native American peoples. Such information can only be acquired with the personal cooperation of Nevada/Utah Indians or their tribal representatives.

SACRED SITES AND AREAS (2.3.2)

Ethnographic data collected over the past century provide information on the types of sites and areas which are significant in traditional Great Basin Indian religious systems.

Mountain Peaks and Ranges

Aboriginal Great Basin Indians had an intimate knowledge of their natal territories. Prominent surface features not only served as guides for travel in the

annual subsistence round, but were linked to creation legends and mystic times. The natural environment was formed When Animals Were People, and hence the entire aboriginal territory or selected features therein are regarded as sacred.

Wolf is noted as the creator of mountains, valleys, and canyons among the Ute (Fowler and Fowler, 1971:77) and Southern Paiutes (Kelly, 1964:133). Goshute legends recount the formation of the Deep Creek Mountains and Snake Range by Hawk (Malouf, Dibble, and Smith, 1950:45). Ancient giants play a prominent role in Northern Paiute lore. One legend recounts how Coyote slew the cannibalistic giant Numuzoho with a large stone. The mountains in Northern Paiute country are the result of the giant's kicking and thrashing before death (Kelly, 1938:372).

Certain mountain peaks are regarded as the homes of spirit-animals, and are therefore very powerful and sacred places. Charleston Peak in the Spring Mountains of southern Nevada is noted as the home of Wolf and Coyote and of all shaman's familiars by the western bands of Southern Paiutes (Kroeber, 1925:596; Laird, 1976:32). The Chemehuevi band also regards the entire Panamint Range in California as holy ground (Laird, 1976:122). In Northern Paiute territory, Job's Peak in the Stillwater Range is identified as the place where Ocean Woman created Indians (Lowie 1924:200), and the mountain where Wolf (Numa na ah, "Father of the People") resides (Fowler and Fowler, 1971:246; Johnson, 1975:15). Mount Grant, or Duranga, is also regarded as sacred by the Walker River Paiutes (Johnson, 1975:15).

Sacred mountain areas, as the abodes of spirit-animals, are places which may be approached by Great Basin Indians for the acquisition of supernatural power. Steward (1940:492) notes that Shoshone peoples often deliberately sought dreams and visions in mountain areas, although specific peaks or ranges are not identified. According to Lowie (1924a:296), Shoshone vision quests were associated with encounters with the dwarf Mountain Man. An identical pattern is noted for the Goshute of Northern Utah (Steward, 1943:282-283), who reportedly traveled to the mountains south of Lucin and in the vicinity of Washakie for the procurement of visions associated with this creature. Chemehuevi Southern Paiute shamans journeyed to Charleston Peak for visionary powers (Laird, 1976:32, 122). A Northern Paiute informant of Lowie (1924a:294) indicated that a mountain in the Walker River district was regularly approached by persons in quest of a vision. This reference may be to the sacred Mount Grant, noted above.

In addition to providing abodes to animal-spirits and dwarf familiars, mountain ranges may contain other creatures or evil spirits. Mountain Man himself is a potential danger, since in addition to aiding selected mortals through visions, he also has powers to slay humans with miniature arrows (Lowie, 1924a:296). In 1880, John Wesley Powell recorded the Northern Paiute belief in three separate mountain creatures: (1) a naked and very cruel giant, I-ho-pi-wo-ya, who lives with his wife in the mountains at Austin, (2) a great serpent, Pa-va-wo-gwok, residing at Spice Valley Mountain, and (3) a giant eagle, Pa-va-kwi-na, who lives in a mountain near Humboldt sink (cf. Fowler and Fowler, 1971:241).

It is likely that all mountain ranges and peaks had significance in aboriginal times. Only a small number of these places of supernatural power have been recorded in the anthropological literature. Knowledge of some of these sites and areas has been preserved among elder or traditionalist Native Americans, some of whom may continue the ancient pattern of religious retreats for visionary power. In

a mid-1960s position statement on Indian-White relations, Stanley Smart, a prominent Nevada Indian from Fort McDermitt, asserted:

There are still some mountains that await Indians who really believe in the Great Spirit's ways to get power in case of emergency, like Indian doctoring to save one from sickness and death (Forbes, 1967:263).

Caves and Rocks

Caves and unusual rocks or rock outcroppings are noted in myth and legend in a manner similar to that of mountains. In some instances, mountains gain their sacred connotation from the nature of the caves which they contain. In Northern Paiute country, for example, Star Peak in the Humboldt Range has religious significance because its many caves are said to have been utilized by Wolf to keep animals in mystic times (Fowler and Fowler, 1971:225-226, 241-242, 246).

Other caves and rocks have mythological importance in their own right. A cave in the northern end of Cave Valley is noted in Shoshone legend as containing an entrance to another world (Steward, 1938:131; Wheeler, 1875: 60). A large cavern on the east shore of Lake Tahoe is referred to by Bancroft (1886:90) as a Washo spirit lodge. This cave is related to a creation myth in which the Great Spirit caused an upheaval and flood in order to expel an evil enemy tribe. It is said that those trapped and drowned inside the cavern may still be heard wailing. Downs (1966:17) also refers to perhaps the same great rock at Lake Tahoe. The rock is said to contain a secret shaman's hiding place from which shamans could follow a submerged roadway of white sand to the other end of the lake without drowning.

Special caves are also universally regarded in Great Basin Indian religions as the residences of spirit-animals or anthropomorphic creatures. These places are seen as extremely powerful and dangerous. Individuals brave enough to sleep at such caves may do so for the acquisition of a familiar for shamanistic purposes or for a guardian spirit or luck in a particular venture. This practice is documented for the Nevada Shoshone and the Goshute, who often secured the vision and aid of the dwarf Mountain Man (Malouf, 1974:81; Steward, 1943:282; Steward, 1940:492). The Ute and Southern Paiute are also known to have sought non-shamanistic guardian spirits in caves (Stewart, 1942:333). The Chemehuevi band of Southern Paiutes utilized caves for the acquisition of spirit-animals or familiars both at Charleston Peak and at the distant Lehman's Cave on Wheeler Peak in east-central Nevada (Kelly, 1936:129; Laird, 1976:39, 245). Similar practices are noted for the Northern Paiute. Park's (1934:99, 102-103) 1933 interviews of Paiutes at Pyramid Lake, Walker Lake, Reno, Fallon, and Yerington revealed the existence of eight local sacred caves where visions could be acquired. A shaman located one such cave as being a mountain just below Dayton, Nevada.

Caves, like mountains, may also be occupied by harmful or evil creatures. The Ute believed certain caves to be the homes of dwarfs who caused pneumonia by shooting people with miniature arrows (Stewart, 1942:318). These creatures seem identical to the Shoshone and Goshute Mountain Man. An early report by Egan (Egan and Egan, 1917:275) refers to a large cave on the side of a knoll at the very south end of the Shell Creek Range which was said by local Shoshones to be inhabited by an evil spirit. Similarly, Washo legends hold that a cave near Gardnerville, Nevada is the ancient dwelling place of a carnivorous one-eyed, one-legged giant,

Hanglwuiwui (Downs, 1966:61). This cave is still regarded as dangerous by many contemporary Washo.

The frequent association of caves and rock outcroppings with both sacredness and danger is reinforced by the ancient Great Basin Indian custom of placing their dead in these areas. A discussion of this important aspect of Native American religious ideology appears below.

Special rocks in Northern Paiute territory have been noted by travelers and scholars as sources of curative power for local Native Americans. One such rock was located at the floor of Simpson Pass, which divides the Desert Mountains and Terrill Mountains in Lyon County (this rock was bulldozed during highway construction for U.S. 95). Known alternatively as Doctor Rock or Medicine Rock, it was approached by Paiutes with prayers for good health and general well-being, after which offerings of beads and later buttons and coins were left in the small holes which covered its surface (Simpson, 1876:87; Wheat, 1967:115; Heizer and Baumhoff, 1962:48). Similar medicine rocks are found today on the Walker River Indian Reservation. According to Johnson (1975:94): "The People (Paiutes), when entering the reservation, leave offerings at the rock and pray for good health." In addition, Heizer and Baumhoff (1962:60) refer to a Medicine Rock (site Pe-27) in the Humboldt Range, Pershing County (see Figure 2.3-1). Northern Paiutes formerly visited this cliff to lick nitrate salts from its face. All of these curing rocks, and many of the sacred caves and rock shelters throughout the Great Basin are associated with Indian petroglyphs and pictographs.

Rock Art

Great Basin petroglyphs and pictographs were first recorded systematically by Mallery (1886:24-25; 1893:92-96, 117). Attempts to consolidate and expand site data for the area have been subsequently made by Steward (1929) and Heizer and Baumhoff (1962). The distribution of known rock art sites in Nevada and western Utah is seen in Figures 2.3-1 and 2.3-2. Since vast areas of both states have not been surveyed, it is likely that many more sites exist which are not yet recorded.

Rock art appears to be a very ancient tradition in the Great Basin, and may be associated with several different populations which variously inhabited the area. Present methods for dating rock art sites are based upon the superposition of art elements, the degree of deposits or sedimentation, differential patination, and association with archaeological remains. Results at this point are at best tentative. Heizer and Baumhoff (1962) have distinguished a number of distinct styles in the rock art of Nevada and eastern California, and have assigned them to separate traditions or chronological periods. The oldest petroglyphs are dated at 5000-3000 B.C., and the most recent forms from 1000 B.C. to 1500 A.D.

The question of the relationship of historic Great Basin Indian populations with local rock art is complicated by several factors. First, there are conflicting theories on the relative antiquity of Numic-speakers or Shoshoneans in the Great Basin. Lamb (1958) and several others after him have argued that Numic expansion into this area was relatively recent. Still other scholars note the possibility of an *in situ* linear sequence from the ancient Desert Culture to historic ones (cf. Schaafsma, 1971:136-145). A second complicating factor is the testimony of contemporary Native Americans. Goshute Indians of Deep Creek attribute picto-

Map Key.

COUNTY SITE	SITE NAME	ROCK ART TYPE ¹	COUNTY SITE	SITE NAME	ROCK ART TYPE ¹
Churchill			Lyon		
Ch-3	Grimes Petroglyph Area	PE	Ly-1	East Walker River	PE
Ch-16	Hidden Cave	PE	Ly-2	Smith Valley	PE
Ch-20	Fish Cave	PE	Ly-3	Prayer Cave	PI
Ch-26	Burnt Cave	PI	Ly-5	—	PE
Ch-49	Dynamite Cave	PI	Ly-7	Simpson Pass ⁴	PE
Ch-53	Flat Top Cave	PI	Mineral		
Ch-55	Salt Cave	PI	Mi-2	Cottonwood Canyon	PE
Ch-57	Allen Springs	PE/PI	Mi-3	—	PE
Ch-58	Lone Butte, Rattlesnake Hill ²	PE	Mi-4	Garfield Flat	PE
Ch-64	Flat Top No. 2	PE	Mi-5	Whiskey Flat	PE/PI
Ch-71	—	PE	Mi-13	Redrock Canyon	PI
Ch-95	—	PI	Mi-14	Rattlesnake Well	PI
Ch-117	Lahontan Reservoir	PE	Mi-17	Dutch Creek	PE
Ch-120	Rawhide Flats	PE	Mi-22	Huntoon Valley	PE
Ch-123	Drumm Ranch	PE			
Clark			Nye		
Cl-1	Valley of Fire, Atlatl Rock	PE	Ny-1	—	PE
Cl-2	Grapevine Canyon	PE	Ny-2	—	PE
Cl-3	Hiko Springs	PE	Ny-3	—	PE
Cl-4	Kane Springs	PE/PE	Ny-21	—	PE
Cl-5	Lost City, Pueblo Grande	PE	Ny-22	—	PE
Cl-7	—	PE	Ny-25	Big George Cave	PE
Cl-121	Lewis Holes	PE	Ny-29	Ammonia Tanks	PE
Cl-123	Keyhold Canyon	PE	Ny-33	—	PE
Cl-124	Arrowhead Canyon	PE	Ny-44	—	PE
Cl-129	Crystal Springs	PE	Pershing		
Cl-130	—	PE	Pe-10	Pole Canyon	PE
Cl-131	Christmas Tree Pass	PE	Pe-14	Leonard Rock Shelter	PE
Cl-143	—	PE	Pe-27	Medicine Rock	PE
Cl-145	Mouse's Tank	PE	Pe-36	Star Canyon	PE
Cl-146	—	PE	Pe-40	Painted Cave	PE
Douglas			Pe-59	—	PE
Do-22	Genoa ³	PE	Storey		
Do-35	—	PE	St-1	Lagomarsino	PE
Elko			Washoe		
El-1	—	PE	Wa-5	Spanish Springs Valley	PE
Esmeralda			Wa-7	—	PE
Es-1	—	PE	Wa-20	Smokey Flat	PE
Es-2	—	ND	Wa-26	Paul Runyan's Corral	PE
Es-3	—	PE	Wa-29	—	PE
Es-5	—	ND	Wa-35	Court of Antiquity	PE
Eureka			Wa-67	—	PE
Eu-1	Dunphy	PE	Wa-68	Verdi	PE
Humboldt			Wa-69	Massacre Lake	PE
Hu-5	—	PE	Wa-119	—	PE
Hu-7	—	PE	Wa-130	—	PE
Lander			Wa-131	Pipe Spring	PE
La-1	Potts Cave	PI	Wa-135	—	PE
La-9	Hickison Summit	PE/PI	Wa-137	—	PE
Lincoln			Wa-139	—	PE
Li-1	—	PE	Wa-142	—	PE
Li-3	—	PI	White Pine		
Li-4	Hiko Springs	PE	Wh-3	—	PE
Li-5	—	PI	Wh-11	Tunnel Canyon	PE
Li-6	—	PI	Wh-12	—	PE
			Wh-13	Katchina Rock Shelter	PE
			Wh-14	Chokecherry Creek	PE
			Wh-15	Mosier Canyon	PE

¹PE = petroglyph; PI = pictograph; ND = no data

²Site has been destroyed

³Boulder removed from Gardnerville Area—now at Nevada State Museum

⁴Known as Medicine Rock or Doctor Rock; bulldozed for highway construction

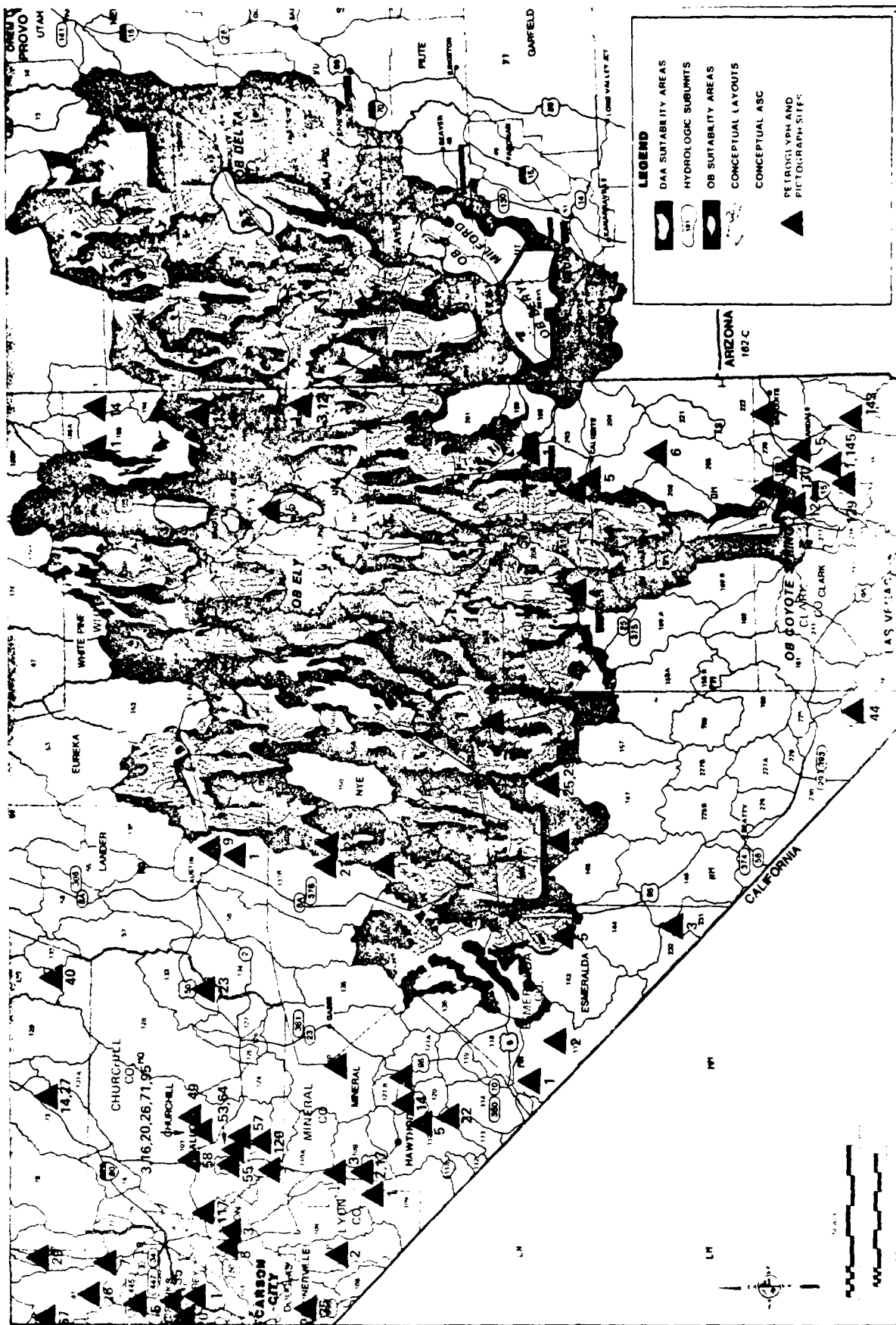


Figure 2.3-1. Key map of Nevada petroglyph and pictograph sites and their approximate locations (after Heizer and Baumhoff, 1962).

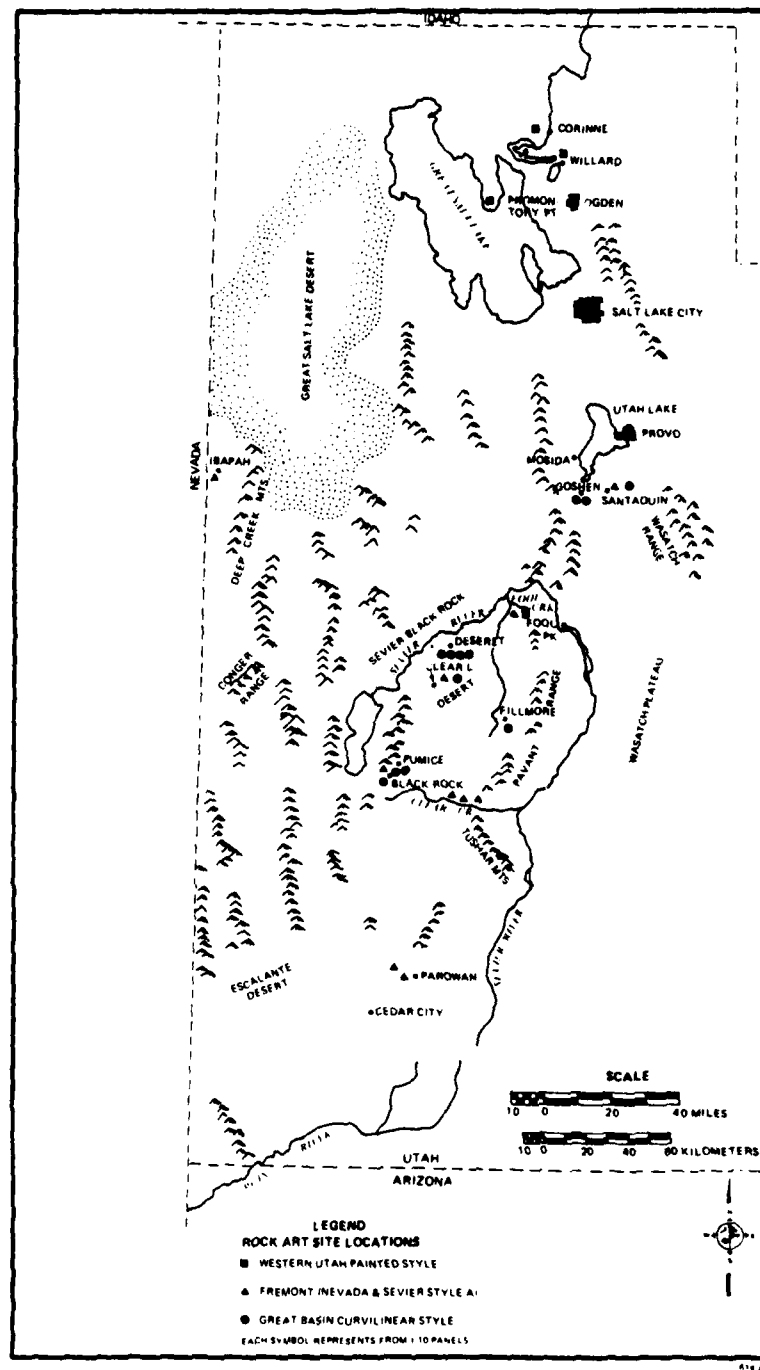


Figure 2.3-2. Western Utah rock art sites and their approximate locations (after Schaafsma, 1971).

graphs in local caves to ancient giants (Reagan, 1929:115-116; Malouf, Dibble, and Smith, 1950:46). Northern Paiutes typically credit the origin of petroglyphs in their territory to Coyote (Stewart, 1941:418; Wheat 1976:115). Similarly, both Utes and Southern Paiutes attribute petroglyphs and pictographs to animal-spirits or ancient populations (Stewart, 1942:321). Heizer and Baumhoff (1959:905) assert that all historic Great Basin Indians deny responsibility for local rock art.

Indian testimony would seem to support the view that the ancestors of modern Numic-speakers entered the Great Basin at some point after petroglyphs and pictographs were made. The problem, however, is not so easily resolved. Heizer and Baumhoff (1962:232-234) have noted that some styles of rock art, such as scratched petroglyphs and Great Basin painted pictographs, are recent (1000 B.C.-A.D. 1500) in origin, and attributable to the immediate ancestors of contemporary Native Americans. The Whiskey Flat petroglyphs (site Mi-5) in central Mineral County, Nevada (see Figure 2.3-1), for example, are associated with Northern Paiute cultural deposits from the late prehistoric period. At least some of the petroglyphs at this site appear to be attributable to these peoples. Other scholars (Huscher and Huscher, 1940; Henderson, 1946) have pointed to possible relationships of the Ute with petroglyphs in southeastern Utah. The most convincing evidence of the continuation of this art form into the historic period, however, is found at Kane Springs (site C1-4) in northcentral Clark County, Nevada (see Figure 2.3-1). Here, some of the petroglyphs depict men on horseback with sombreros and wheeled carts. Heizer and Baumhoff (1962:230) note that these glyphs probably were made sometime after 1830 when the first wheeled carts appeared along the Old Spanish Trail in this area.

How, then, are these data to be interpreted in light of the testimony of 20th Century Great Basin Indians? One explanation is that Native Americans deny to outsiders any relationship with rock art due to their general reluctance to speak of sacred matters. Concern for their preservation is an additional factor. Stewart's (1941:418) Northern Paiute informants, for example, not only attributed local petroglyphs to Coyote or the devil, but claimed ignorance regarding the location of these sites. Heizer and Baumhoff (1962:227) comment:

Stewart also asked whether petroglyphs occurred within band areas and several informants said they did not, even in cases where this was palpably false. It is especially odd that the Stillwater band denied the presence of petroglyphs when there are about a dozen sites recorded in their territory, including the large one at Grimes (site Ch-3).

Native American reticence regarding these sites may play a role in their public dissociation from what are in essence sacred areas. A second important factor is the apparent decline in rock art production after A.D. 1500, and a fundamental shift in the function and meaning of these sites to Great Basin Indians. In order to explore this issue more fully, the question of why petroglyphs may have been made in prehistoric times must be addressed.

A widely accepted hypothesis on the origin and meaning of Nevada petroglyphic sites was advanced by Heizer and Baumhoff (1959) some twenty years ago, and expanded in subsequent publications (Heizer and Baumhoff, 1962; Heizer and Hester, 1978). In their extensive study of rock art in western and central Nevada, the authors began to note a characteristic association of petroglyphic sites with

prehistoric game migration trails, particularly where such trails approached water tanks and springs or canyon narrows, draws, and natural bottlenecks. The occurrence of a majority of petroglyphic sites at these locations, unusually well-suited for the ambush of game herds, led to the hypothesis that rock art is primarily associated with hunting, and more particularly with hunting magic. Ritual or sacred aspects of the hunt have been well documented for historic Great Basin Indians (Steward, 1938:34-35; Steward and Wheeler-Voeglin, 1974:51; Park, 1934:108-109; Underhill, 1961; Downs, 1966:31). Game animals and hunting scenes are familiar motifs in rock art panels, as are anthropomorphic and decorated human figures associated by scholars with ceremonial or ritual content.

Further studies by Heizer and Baumhoff (1962) in Nevada provided more evidence in support of the thesis that petroglyphs were made, perhaps by shamans, in connection with hunting magic. Two characteristic patterns were delineated for regional areas of the state. In southern Nevada, rock art sites typically occur in narrow draws which lead to a source of water frequented by game. The primary animal hunted in this arid lowland region in prehistoric times was probably the mountain sheep. In northern Nevada, rock art sites are consistently associated with draws along established migratory game trails of antelope and deer. Archaeological remnants of blinds, diversionary fences, and corrals at several large sites support the notion that animals were driven, trapped, and slaughtered in these natural ambush arenas. Schaafsma (1971:147-149) feels that the Heizer-Baumhoff theory is generally consistent with patterns observed in the rock art sites of western Utah.

If, as it seems possible, petroglyphs were made by shamans at established ambush sites as part of the ritual to lure and "steal the souls" of game animals, why was this practice largely discontinued by A.D. 1500? Some scholars have theorized that the rapid decline in game associated with late prehistoric and early historic times may have undermined the ritual belief system with which the production of petroglyphs was associated (Von Werlhof, 1965; Grant, Baird, and Pringle, 1968). An alternate theory proposed here is that the ambush sites themselves may have been gradually abandoned, along with the pattern of large communal hunts, as game became depleted. The problem may have been more one of the diminishing rewards of large communal activity rather than a diminished belief in the efficacy of shamanistic rituals which persisted in basic content to the modern period. If petroglyph-making was the province only of shamans, the decline in their production may relate more to the general local availability of these specialists as Indian population segments dispersed to more efficiently exploit the dwindling numbers of mountain sheep, antelope, and deer. While the belief in hunting magic remained strong well into the historic period, the degree of elaboration and the number of elements associated with accompanying shamanistic rituals undoubtedly declined over the centuries as these ceremonies became more and more infrequent. The disappearance of a ritual art form, when in the hands of a small number of specialists and practiced with decreasing frequency, is a not uncommon cultural phenomenon.

Despite the apparent abandonment of petroglyph and pictograph production centuries ago, there is considerable evidence to suggest that the sacred nature of these rock art sites has been maintained in Great Basin Indian cultures. Antelope shamans in historic times appear not to have visited these areas for the performance of hunting-magic rituals. Caves and rock outcroppings with petroglyphs and pictographs were, however, regularly approached by incumbent shamans for the

acquisition of animal-spirit familiars, and by ordinary persons to secure guardian spirits or special favors:

Long ago the Shoshone would go to the hills or rocks in the mountains where there was "a kind of writing." There they would sleep for from one to three nights in the quest of a dream, but without fasting; in the morning they went back home. Some animal or person might appear to the would-be visionary and tell him he was to be a physician (Lowie, 1924:296).

A similar pattern is noted for the Goshute:

Certain caves, or rock outcroppings were believed to be the abode of the spirits with whom they wish to communicate. Often they were areas where there were numerous pictographs painted on the cave walls, or on rocks. Such an area was known as pohaghani, and suppliants were pohaghants. When in this pohaghani he would ask for favors from the spirits. If they were favorably impressed they would reveal much information. Elk might give him doctoring powers, while Water Baby would make him hardy in war. Most likely he saw Mountain Man, Toyanumbi, who taught him how to use herbs as medicine, or gave him hunting powers. Mountain Man was considered as a sort of partner to the shaman (Malouf, 1974:81-82).

The acquisition of non-shamanistic guardian spirits by sleeping near pictograph sites is recorded for both the Ute and Southern Paiute (Stewart, 1942:333). In addition, it is notable that Northern Paiute curing rocks, to which prayers and offerings are made, are covered with petroglyphs.

Trails

The ecological adaptation of Great Basin Indians in prehistoric and early historic times required a high degree of mobility for a significant portion of the annual cycle. Transhuman movements for subsistence and ritual activities typically occurred along established routes which were widely known and utilized from one generation to the next. Major trails were regarded by Native Americans not only as highways for travel, but as sacred pathways which symbolized the cultural continuity of ancient and modern peoples. Powell made the following observations of Ute behavior in the 19th Century:

It is curious to notice with what tenacity an Indian clings to a trail; a path which has been followed by his forefathers is sacred to him, and though in the constant and rapid erosion of the gulches and sides of the hills and mountains these trails have become very difficult yet he never abandons them when they can by any possibility be followed, even though a shorter and better road is very perceptible (in Fowler and Fowler, 1971:39).

Trails to sites where communications with the spirit-world were undertaken were undoubtedly also regarded as sacred. Some areas of the Great Basin contain a complex network of trails which link special mountains, caves, petroglyphs, and springs (Heizer and Baumhoff, 1962:21-25). As noted above, sacred sites are often associated with petroglyphs and pictographs, and these in turn frequently occur along established animal migration trails. Deer and antelope trails may have themselves been regarded as sacred in the past due to the religious activity which

surrounded the hunt. Although the production of petroglyphs apparently did not extend with any frequency into the historic period, the performance of sacred rituals by shamans at hunting sites along these trails was a persistent feature among the immediate ancestors of contemporary Great Basin Indians (Steward, 1938:36).

Lakes and Springs

Native American religions attach special significance to water bodies and water sources. For Great Basin Indians, all lakes, streams, and springs contained spirit-animals or anthropomorphic creatures, and were thereby linked to the sacred domain.

Like other prominent physiographic features, lakes were regarded as the outcome of dramatic events which took place in mystic times. Washo tradition, for example, holds that lakes in the Sierras were the result of an incident between Weasel and a Water Baby. Water Baby was captured by Weasel, and the former flooded the world as a sign of his displeasure. When the water receded, only the lakes remained (Downs, 1966:60-61). Lake Tahoe is the center of Washo mythology, and every stream mouth and shoreline feature has myths associated with it (Downs, 1966:16-17). According to Northern Paiute tradition, Walker Lake is also a remnant of a great flood during which Sagehen sat atop the adjacent sacred Mount Grant and saved fire for future generations (Johnson, 1975:15).

Major lakes in Northern Paiute territory are noted in legends to contain serpents resembling huge dinosaurs or amphibian reptiles. Sitings of such a monster in the vicinity of Walker Lake by non-Indians have been reported from 1868 through 1956 (Johnson, 1975:182-186). The Walker Lake serpent has thus taken on an aura much like that of the famous Loch Ness monster in Scotland. Northern Paiute legends hold that a similar creature exists in Pyramid Lake. Here a demon-deity serpent is held responsible for the frequent whirlpools surrounding the nine lake islands, and is said to devour the unwary (Bancroft, 1886:135-136). Winnemucca Lake is also said to contain a dangerous giant green snake, and a particularly cruel water baby which may cause death to anyone who sees it (Stewart, 1941:444). Among the Ute, great serpents were believed to inhabit both Utah and Fish lakes. As at Walker Lake, several alleged sitings of the Utah Lake monster by early Anglo settlers promulgated local Indian legends (Jorgensen, 1913:811).

The most important link between water and the supernatural concerns the spirit-animals or spirit-creatures which, in Great Basin Indian cosmologies, inhabit all lakes, streams, and springs. Prominent in this respect is the Water Baby, a source of supernatural power which can be deliberately solicited by humans. According to Steward (1940:492), the Shoshone formerly approached springs in order to acquire a vision or familiar. Water babies also served as shaman's familiars among the Goshute (Malouf 1974:82), Northern Paiute (Park, 1934:100; Steward, 1941:258), and Ute and Southern Paiute (Stewart, 1942:318). As at special mountains and caves, the acquisition of a vision required the prospective shaman to spend a night at the spring. Bodies of water and the water babies they contained could also be approached by ordinary persons for the granting of special favors. Among the Washo, for example, an individual seeking assistance may deposit an especially fine basket in the spring or pond as an offering to the spirit (Downs, 1966:62).

Two cold water springs are specifically noted in the literature as spiritually active (although all springs contain this potential): Deep Spring in Skull Valley, Goshute territory, reputed to contain water babies (Chamberlin 1913:8); and a spring called pai dopi (clay rock) near the west shore of Walker Lake, three miles south of Schurz, in Northern Paiute territory. At Pai dopi a hunter could acquire luck with deer by sleeping near the spring and obtaining a dream-vision of the circumstances of the hunt.

Although data are incomplete, there is some indication in Indian traditions that all water resources were felt to share a common subterranean connection. In 1880, for example, Powell noted the Northern Paiute concept, Tu-vi-twi-u-su-gu-va. This referred to a single reservoir of "deep water" which connects all lakes, and from which all springs ultimately emanate (in Fowler and Fowler, 1971:246). A similar underground connection of springs is recognized by California Shoshoneans. In Cahuilla traditional belief, for example, both spirits and shamans utilized these underground pathways to travel magically from one place to another (Bean, 1972). Interestingly, a significant number of springs in the Great Basin are associated with petroglyphs and pictographs, the reputed creations of shaman artists (Heizer and Baumhoff, 1962).

Water as a link to the spirit world and mystic times is also underscored in beliefs surrounding mineral hot springs. In Ute traditional belief, hot springs are extremely sacred places owned by spirits, to which prayers and offerings are made (Stewart, 1942:301). Northern Paiute tradition holds that hot springs are created by the deep, subterranean cooking fires of water babies (Fowler and Fowler, 1971:241). In prehistoric and historic times, hot springs were utilized by Paiutes for curative mineral baths. At these sites, individuals could avail themselves of the opportunity for direct supernatural assistance from the spirit-world. Hot springs were "paid" by bathers with offerings of bone beads and other valuables (Stewart, 1941:430, 440). Mineral hot springs are rare, and access to these important sacred areas has become restricted or prohibited to Indians through public and private land appropriations. The current dispute of Northern Paiutes with the U.S. Navy over access to sacred Coso Hot Springs for the performance of traditional rituals is indicative of the persistence of Native American religious beliefs.

The use of hot springs for ritual purification and curing has an interesting parallel among Native Americans in the traditional sweat bath. In most areas of the Great Basin, sweatlodges consisted of small enclosures with a central or corner hearth of heated stones over which water was poured to create steam. Sweatlodges are reported for the Goshute (Stewart, 1943:308), and are specifically related to special shamans and curing rituals among the Nevada Shoshone (Stewart, 1941:261) and Ute (Stewart, 1942:260). They also appear among the Southern Paiute (Lowie, 1924a: 307-309) and Northern Paiute (Park, 1938:57), but in both instances are recent acquisitions. It is notable that the Northern Paiute sweatlodges were adopted in the 1880s, after these peoples were restricted to reservations and less able to visit sacred hot springs on a regular basis (Stewart, 1941:430). The curing aspect of sweatbaths, however, was not accepted by the Northern Paiute. They were utilized for hygienic purposes only.

Minerals

Certain materials in the natural environment are regarded in traditional Great Basin Indian beliefs to have special supernatural power for curing and the prevention

of misfortune. Speculorite, for example, was gathered by the Northern Paiute for its special magical properties which are believed to repel whirlwinds (ghosts) when sprinkled around a dwelling (Stewart, 1941:445).

Clays were exploited by Nevada/Utah peoples not only for pottery, but for the production of paints. Red clays are especially valued for their protective value. Among the Northern Paiute, brick-colored clay is gathered from a deposit and shaped into balls to facilitate transport. A red paint is then produced which, when applied to the feet, is believed to offer protection against rattlesnake bites. It is applied to other areas of the body as a medicine, and is also utilized for body decoration. Red clay is still in demand by Northern Paiutes for use in the traditional manner (Wheat, 1967:27). The use of red clay for protective functions is also reported for the Southern Paiute, who believe it effective in repelling water babies, ghosts, and evil spirits (Kelly, 1964:138, 141). The Washo use red clay paints in the traditional girl's puberty rite (Freed and Freed, 1963:29; Downs, 1966:24).

White clay appears to have a special relationship with the sacred domain in Great Basin Indian cultures. Among the Northern Paiute, there are definite connections between the use of white paint and animal-spirit world. Shamans often apply white paint to their bodies during vision quests to acquire familiars, and regularly apply white paint to the bodies of their patients as a prerequisite to sacred curing rituals (Park, 1934:103, 106-107). A similar relationship with curing persists among the modern Duckwater Shoshone. Smith (1972:74) notes that white clay (appah) is added to teas made from native medicinal plants "to make it work." White clay thus seems to serve as a catalyst or medium for communication or power transmission from the spirit-world.

Burials and Cremations

The remains of both the immediate and distant ancestors of contemporary Great Basin Indians are distributed throughout the upland regions of Nevada and Utah. All burial and cremation sites are regarded as extremely sacred and dangerous.

In Great Basin Indian traditional beliefs, the soul of a dead person travelled to another place, which was typically envisioned as bountiful and happy. For the Washo, the afterworld was somewhere in the sky to the south, although murderers were sent to a separate place for punishment (Downs, 1966:58-59). The Northern Paiute felt that the souls of the dead travelled south on the Milky Way (Lowie, 1924a:295; Kelly, 1938:372; Stewart, 1941:444). The Shoshone, Ute, and Southern Paiute believed that the afterworld was somewhere in the sky where the creator, Wolf, lives (Jorgensen, 1913:809; Stewart, 1941:265; Stewart, 1942:319). In Chemehuevi Southern Paiute tradition (Laird, 1976:40), souls of the dead travel to Spirit Land far to the north (perhaps to sacred Charleston Peak, home of Wolf and other animal-spirits). A variation was recorded for the Ute by Powell in the 1880s. He noted that the Ute land of the dead was entered by an underground passageway, across a bridge spanning a deep chasm, and finally across a mountain to reach a beautiful valley of eternal feasting and dancing (in Fowler and Fowler, 1971:66-67).

The traditional funeral rites of Great Basin Indians shared a common feature which often came as a surprise to foreign observers--the dead were publically admonished to go away. The following Northern Paiute speeches delivered to a

corpse are typical: "Do not think of coming back, for you are going for good. Good-bye, you are going to a good place. Be good while you are there" (Lowie 1924a:281); "Do not think of coming back, stay away, we don't want you" (Stewart, 1941:444). Such exhortations relate to a fear of the dead, whose jealous and vengeful spirits return to harm the living.

The property of the deceased was often viewed as the road by which the dead return, and was therefore burned or redistributed to others. Similarly, houses occupied by the deceased were either destroyed, or the settlement abandoned. A taboo on mentioning the name of a dead person was universal. Ghosts were thought to appear in the form of whirlwinds. Among the Southern Paiute, whirlwinds could be repelled by opening and closing a bag made of sewn flicker wings. Protection against ghosts was also afforded by red paint and ashes, or by singing at night camp; when traveling to drive away the evil spirits of those who may have met their death in the area. Ghosts could be heard whistling and yelling at night. The spirits of the dead may use toenail clippings of living persons to choke them, or may kill simply by "shooting their power" into an individual (see Stewart, 1941:257; Stewart, 1942:314, 319; Freed and Freed, 1963:32-33; Kelly, 1964:102, 140-142, 166; Downs, 1966:59-60).

Aboriginal methods of disposing of the dead were undoubtedly influenced by the limited tool inventory of traditional cultures and the hard desert soil. Corpses were typically placed above rather than below the ground, in natural enclosed or sheltered areas. Of all the Nevada/Utah tribal groups, only the Washo cremated their dead in prehistoric times, a trait shared with their Hokan linguistic relatives south of the Great Basin. Typically, the corpse was cremated by burning the house of the deceased, after which survivors moved to a new settlement. Historic Washo abandoned this custom after government laws forced them to bury their dead in cemeteries (Curtis, 1926:97; Downs, 1966:108-109).

The Northern Paiute in former times followed the general Shoshonean pattern of carrying the deceased into the hills or mountains and placing the corpse in a rock cairn or cave (Yarrow, 1881:143; Lowie, 1924a:281). In historic times, burials often included animal and even human sacrifice (Hopkins, 1883). Powell noted in the 1880s that the body of a man was sewn inside the skin of his slain horse before interment in a rock cairn (in Fowler and Fowler, 1971:215). A variation of the Washo pattern of cremation was also apparently practiced by the Northern Paiute. In this case, the corpse was carried into the mountains and placed on a pyre over a hole or natural depression. After exhumation, the ashes were covered with rocks (Stewart, 1941:443).

Among the Shoshone, the corpse was dressed in finest clothing and taken to the mountains. Preferred interment areas were caves, the entrance to which was blocked by stones. Rock cairns were also utilized, ideally in the area of rock slides, talus slopes, or soft dirt (Lowie, 1924a:282; Stewart, 1941:257). In historic times, some equestrian northern Shoshone adopted the Plains Indian method of placing the corpse in a special burial lodge, which was then abandoned by survivors (Yarrow, 1881:153-154).

Goshute methods of disposing of the dead followed the typical pattern of removal of the corpse to the mountains and interment in either caves or rock cairns (Chamberlin, 1913:6; Stewart, 1943:343; Taylor, 1954:13). Identical patterns are

reported for the Ute, who placed the deceased in mountain caves or rock cairns (Yarrow, 1881:127-128; Stewart, 1942:312-313) or alternatively in soft ground or natural depressions and covered with rocks (Lowie, 1924a:279-280). Notably, both the Goshute and Ute are reported to have also deposited their dead in springs (Yarrow, 1888:181; Stewart, 1943:343; Stewart, 1942:333). Spring burials are perplexing, given the limited fresh water sources available to local Indians in western Utah. This option may well have been reserved for shamans or other important persons.

Southern Paiute mortuary practices follow two distinct chronological patterns. Until recent times, corpses were placed, often in rabbit-skin blankets, in caves, rock clefts and shelters, or at the base of hills or washes, and covered with stones. By the early historic period, cremation had been generally adopted from Hokan-Yuman peoples to the south. This method involved inhumation of the corpse and the personal property of the deceased on a funeral pyre (Kelly, 1964:101-102; Lowie, 1924a:279; Stewart, 1942:312-313). The diffusion of cremation also led to adoption of the associated annual mourning or cry ceremony, which was performed from six to twelve months after the death. In this ceremony, any remaining possessions of the deceased are burned or redistributed in a sacred ritual, accompanied by prayers, song, and dance (Laird, 1976:41-43).

Although certain general areas for disposal of the dead were undoubtedly favored by local Native American groups, it may be assumed that the skeletal remains of scores of generations are widely distributed at sites beyond the memory of living peoples. Burials have been uncovered at Dynamite Cave and at Medicine Rock in Northern Paiute territory. Both of these sites are additionally associated with pictographs (see Figure 2.3-1). Kelly (1964:188) reports that corpses were regularly deposited among lava boulders just south of Panguitch Lake by the Southern Paiute. In Goshute-Shoshone territory, five aboriginal burial sites are noted in the literature. Spring burials were specifically undertaken in Skull Valley (Yarrow, 1881:181). Cave interments are known or suspected at four locations. Taylor notes the following:

Three miles (5 km) southwest of Garrison there is a large subterranean cave on a spur of the Snake Range (Snake Creek Cave). The entrance is through a narrow crevice under an overhanging rock and there is a vertical drop of 40 ft (12 m) to the floor of the cavern. . . It was the custom of the Gosiutes at the time of first white contact to dispose of their dead by dropping them through the entrance to the cave. A similar practice was noted at Lehman's Cave, where two skeletons were discovered at the bottom of an old natural entrance (1954:13).

Lehman's Cave, in Nevada, was subsequently excavated by Rozaire (1964) and evaluated by Fowler (1977). The skeletal remains of approximately 26 individuals have been recovered, although only 30 percent of the cave floor was excavated. Rozaire (1964:15) notes that nearby Snake Creek Cave, Nevada has a far greater abundance of human bone material.

A fourth area associated with cave burials is suggested by early 20th Century interview data collected by Chamberlin (1913). His Goshute informants referred to an area called A'pa-ya-wi-up, or alternatively I'dju-pa-ya-wi-up, place-names for the extreme southern tip or west slope of the Oquirrh Mountains, Utah:

The name is given to this section as the scene of a very disastrous and long drawn out conflict between the Gosiute and another Indian tribe, which one the author is unable to make wholly certain. The name means in effect "Place of the weeping or wailing of ancestors," the caves in the neighborhood being supposed to be haunted by the shades of those who met death there. Cf. I'dju-pa-ya-wi-up, the same place but not the usual designation or the more correct, as I'djup properly refers to the very first members of the human race when used in this sense, while a'pa refers more generally to less remote ancestors (Chamberlin, 1913:6).

From what is known of Goshute mortuary practices, it may be assumed from Chamberlin's statement that the Oquirrh Mountain caves in question contain the skeletons as well as the ghosts of the ancestors. The two Goshute names for this area, distinguished only by prefix, are intriguing in light of the horizontal nature of sacred time which characterizes Great Basin Indian religions. The alternate place-name refers to Creation or mystic times, and may indicate that these sacred caves contain animal-spirits. It is also possible that the alleged battle itself occurred in mystic rather than modern times, when animal-spirits preyed upon the giants once believed to inhabit the area (Malouf, Dibble, and Smith, 1950:46).

As in Western European cultures, traditional notions about the dead and their spirits or ghosts are tremendously persistent among contemporary Native Americans. Ancestral spirits are believed to reside in the countless interment areas throughout the Great Basin hills and mountains. Any disturbance of the graves of the dead may anger these ghosts, and motivate them to seek vengeance on contemporary Indians. Taylor, for instance, decided to suspend plans for archaeological investigations at Snake Creek Cave due to the expression of such fears:

Our plans to excavate the cave were dropped because of opposition from local Gosiutes, who thought that we would disturb their ancestors (1954:13).

Similar anxieties were recently expressed by Utah Southern Paiute-Pahvant Ute peoples over potential development of selected roadless areas by the U.S. Forest Service:

Residents of the Kanosh Indian Reservation talk of important burial grounds that are located on two roadless areas in the Pavant Range. They would not welcome any decision about these roadless areas that would attract visitors to them (USFS, 1978b:29).

DISCUSSION (2.3.3)

All Great Basin sites and areas which are regarded as sacred in traditional Native American belief have a necessary connection with the spiritworld. Prominent physiographic features, such as mountains and lakes, are the end-products of dramatic events which occurred during mystic times. They are often the homes of creator figures and other animal-spirits, which are the primary source of supernatural power in the universe. At these sites and at special caves and springs, individuals may communicate with the spirit-world through visions and dreams. The wisdom so gained by shamans benefits all mankind. That gained by ordinary persons promotes success in daily life.

The horizontal nature of sacred time in Great Basin Indian religions allows immediate access to mystic power via the pathway of visions. At ancient rock art sites, shamans summoned this power for charming animals of the hunt. It is possible that petroglyphs and pictographs were believed to be sculpted and painted by the animal-spirits themselves, with shamans acting as both the summoning agents and mediums for the physical production of artistic symbols. The characteristic response by historic Indians that petroglyphs were made by Coyote or other animal-spirits ("the ancients") is typically interpreted by scholars to mean that contemporary peoples or their ancestors were not involved in the production of rock art. Such responses, however, may represent traditional religious truths rather than statements of dissociation. This interpretation would help explain the continued use of rock art sites by historic Indians, perhaps centuries after their original production, for the acquisition of familiars and animal-spirit guides. Such sites may represent permanent shrines where animal-spirits have visually communicated with The People, and at which they may be contacted again. Most, if not all, of the sacred mountains, caves, rock shelters, and curing rocks utilized by historic Great Basin Indians for visions and prayer are associated with petroglyphs and pictographs.

As in Judeo-Christian traditions, the spirit-world is balanced by evil elements. The graves or bones of the dead derive their sacred connotation from the evil spirits of the ancestors which lurk at burial sites and which may pursue the living with acts of vengeance. This sacred status diffuses to the caves, rock cairns, springs, and broader traditional areas, notably mountains, where interments are concentrated.

Beliefs regarding the traditional spirit-world are persistent among contemporary Native Americans despite the apparent in-roads made by Christianity over the past century. Whereas missionaries regarded traditional Indian religions as incompatible with the new Faith, this view was not generally shared by their nominal converts. Christianity, for the most part, was merely integrated with or tacked onto aboriginal cosmologies.

2.4 ETHNOHISTORY AND HISTORIC OCCUPATION AREAS

When, in the 19th century, a number of reservations were established in Nevada/Utah, only a small percentage of Indians voluntarily relocated to these areas. Despite the destruction of native food resources, the usurpation of favored settlement areas, and other economic and social hardships precipitated by white immigration, the majority of Native Americans refused to leave ancestral lands. In some areas families remained in the countryside, foraging in the traditional manner until waning resources made life by the old ways impossible. Others congregated into impoverished shanty towns near white settlements where, several decades later, certain colony and reservation lands were finally set aside for them by the government.

Most Native Americans in the study area have thus experienced spatial, temporal, and cultural continuity with native lands and the features they contain. Village sites occupied by their ancestors just three or four generations past are remembered by living peoples, as are important Indian historic landmarks such as battle sites, war refugee camps, homes of famous chiefs, native festival sites, and former shanty-town sites.

A consideration of such historic sites is important for two reasons. First, villages and campsites occupied in the previous century can be defined as cultural

resources, and are therefore subject to protective measures under existing environmental legislation. The ethnohistorical and ethnographic literature provide an additional data source for the identification and location of such sites. An investigation of historic settlement patterns in native areas lends clues to prehistoric ones as well. A second reason for considering historic sites is their cultural importance to contemporary Native Americans. These sensitive sites and areas are part of the long, unwritten history of native peoples, and there is deep concern in modern Indian communities over their preservation for future generations.

The ancestral lands of Nevada/Utah tribal groups will be unevenly impacted if M-X withdrawal and deployment occurs. Since the aboriginal territory of the Washo lies considerably to the west of geotechnically suitable areas, no impacts to the cultural or economic resources of these peoples are foreseen. The Washo, therefore, will not be considered further. Potential deployment areas do fall within the ancestral lands of the remaining four tribal groups.

This chapter will review available ethnohistorical and ethnographic data for the Ute, Southern Paiute, Shoshone, and Northern Paiute to identify aboriginal areas of population concentration and to compare the distribution of known occupation and other historic sites with areas under consideration for potential deployment.

As noted in Section 1.3 above, an effort is made in the historical reconstruction of Indian/non-Indian relationships to emphasize the Native American perspective. Whereas traditional histories often portray Indians as temporary obstacles to manifest destiny, Indians recount the same events as a catastrophic process of genocide and the loss of aboriginal sovereignty. Since history is by definition an interpretive undertaking, bias in both the selection of events and the manner in which they are rationalized and explained varies between Indian and non-Indian chroniclers. By viewing the history of Nevada/Utah tribal groups from the perspective of the aboriginal inhabitants rather than the intruders, Native American concerns and attitudes regarding past and present externally-imposed change are highlighted.

UTE (2.4.1)

The Ute Indians formerly inhabited a large territory extending from the Rocky Mountains in Colorado west, through the state of Utah, to the great deserts near the Nevada border. Aboriginally, Ute throughout this area appear to have been organized into politically autonomous local groups which subsisted on native plant foods, game, and fish. At least four regions in Utah, namely the Uintah Basin, Wasatch piedmont, lower Sevier River, and San Pete Valley, were sufficiently abundant in natural resources to support permanent villages, some of which were allied by an established network of chiefs and sub-chiefs.

Although white settlement of Utah did not commence until the mid-19th century, significant changes in Ute culture occurred decades earlier with the diffusion of horses from the American Southwest. The equestrian adaptation greatly increased the geographical mobility of local groups in food-getting activities, enabling large communities to range great distances throughout the annual subsistence cycle in pursuit of large game, fish, and wild plant foods. The horse not only contributed to increased nomadism, but allowed larger numbers of Ute to congregate on a seasonal or permanent basis. Attachments to local aboriginal territories

became weakened with increased mobility and, accordingly, the locus of political identity and attachment began to shift from specific localities to charismatic leaders. On the basis of historic accounts, it is estimated that equestrianism diffused to Colorado Utes in the mid-18th century, to the Uintah Basin in the 1820s, the Utah Lake region by the 1840s, and to the lower Sevier River area by 1850 (Steward, 1974:42).

The most dramatic changes in Ute aboriginal culture and settlement occurred after the ingress of Mormon settlers in 1847. Lured by areas of natural resource abundance, settlers with large herds of cattle and sheep pressed into the same western Utah valleys selected and occupied by Ute villagers. The effects of this invasion on Indian populations was immediate and devastating. The destruction of natural seed grasses by livestock forced the dislocation of Ute villages and the formation of large, nomadic equestrian bands with fluid membership. Many such groups migrated to the Uintah Basin, an area as yet untouched by white settlement. Utes remaining in ancestral areas of western Utah were reportedly starving by 1862 (Hamblin, 1881:87-89), and preying upon Mormon cattle for subsistence. Raids and eventually full-scale warfare developed between settlers and the followers of famous Ute war chiefs, culminating in the Black Hawk War of 1865-1870. These hostilities and subsequent defeats contributed to the mass exodus of Utes to the Uintah Basin and the newly formed Uintah Reservation where their descendants remain today.

M-X suitable areas in west-central Utah fall within portions of the aboriginal territories of two known western Ute groups, the Timpanogots Ute of the Wasatch piedmont and Utah Lake region, and the Pahvant Ute of the lower Sevier River area. Although data for both groups are scant, areas of population concentration and early historic village sites have been documented by Steward (1938, 1974).

Timpanogots Ute

The Timpanogots Ute, also known as the Tim-Pa-Noys or Timpanoags, occupied several permanent villages along a belt of the Wasatch piedmont extending adjacent to and north and south of Utah Lake, and around the lake itself. Two major Timpanogots village groups are also recorded to the west of Utah Lake in Cedar Valley and one in Tintic Valley (see Figure 2.4-1). The Oquirrh and Tintic Mountains appear to mark the informal boundary between the Timpanogots Ute and Goshute Shoshone to the west.

The first historic account of the Timpanogots is that of the Escalante expedition which penetrated the Utah Lake region in 1776 (Bolton, 1950). At the time of Escalante's visit, the Timpanogots were non-equestrian and living in villages of cane huts or lodges. Subsistence was based largely upon fish, supplemented by seeds, rabbits, waterfowl, and large game. The permanency of these Ute villages allowed the development of stable political integration and an established hierarchy of officials. Escalante noted that the Timpanogots group of villages at what is now American Fork recognized a war chief, two assistant war chiefs, and a civil chief. A second village group visited on the southern shore of Utah Lake was headed by a principal chief and a chief's spokesman.

Few substantive data are available on the Timpanogots Ute from 1776 until the 1840s. Slaving expeditions originating in New Mexico, such as that of Arze and

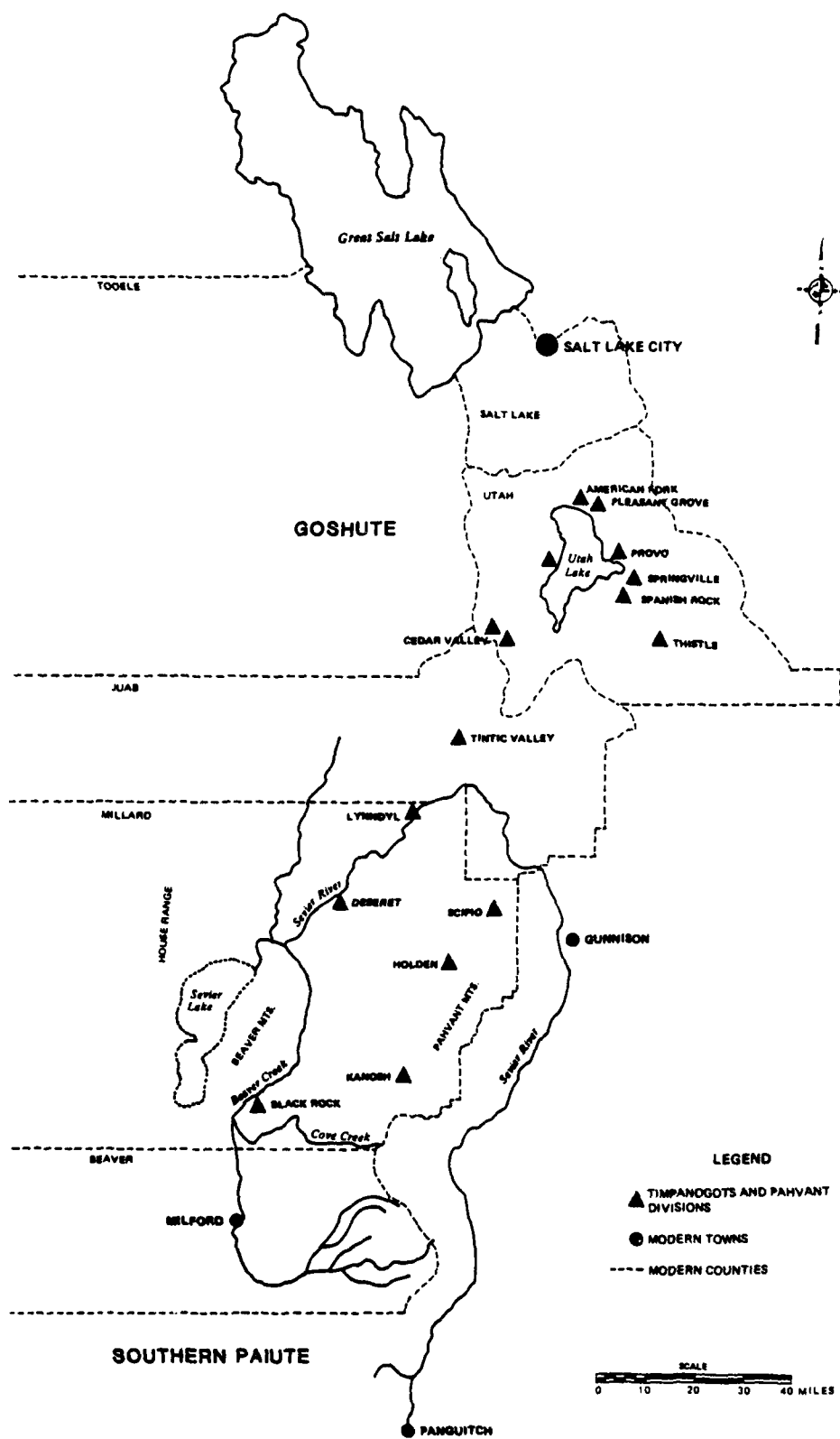


Figure 2.4-1. Occupational areas of the Western Ute (adapted from Steward, 1974).

Lagos in 1813, are known to have penetrated the Utah Lake area, and to have established trading relationships for war captives which were to later become expanded with the development of the Old Spanish Trail. It was perhaps through this market and through contacts with Utes in the Uintah Basin that the Timpanogots began to acquire sufficient horses for the equestrian transition.

By 1840 the Timpanogots were mounted, and well-organized bands began to crystallize around charismatic chiefs. Wakara, also known as Walker, rose to prominence during this period, and is said to have led raiding parties as far as California for the acquisition of horses, cattle, and of Indian captives which were traded to New Mexicans as slaves. Wakara and his men were met near Fillmore in the 1840s by John Fremont, who described them as well-mounted and in possession of rifles. Wakara and another prominent Ute chief, Soweit, journeyed with several hundred followers from Spanish Fork to Salt Lake City in 1848 to visit Mormons who had settled in Salt Lake City.

Timpanogots equestrianism appears to have reached its climax by the late 1840s. The area near modern Provo had, by 1849, become the spring gathering-place of all Utes within a 200 mi (320 km) radius. Here Chief Wakara, subordinate local chiefs, and their hundreds of followers feasted on fish from the annual spawning run, gambled and held horse races, and engaged in important religious events such as the Bear Dance. By 1850 Wakara had achieved the title of "Napoleon of the Desert." His contemporary, Soweit, the Uintah chief, was sometimes alternately proclaimed by Mormons as "King of the whole Ute nation."

As noted earlier, however, Mormon penetration of Timpanogots territory in the 1850s soon destroyed the Ute ecological niche. Chief Wakara died in 1855 and, although succeeded by his brothers, local chiefs began to reassert their sovereignty both in warfare against the settlers and in emigration to the Uintah Basin. Utes who remained in Western Utah until 1865 joined under the Timpanogots Chief Black Hawk for the final unsuccessful struggle to repel the Mormon invasion.

Pahvant Ute

The Pahvant or Pavanduts (water people) inhabited permanent villages on the Sevier River, Beaver River, and on the adjacent western flank of the Pahvant Mountains. Winter villages corresponding to major Pahvant divisions were located at Lynndyl, Deseret, Black Rock, Kanosh, Holden, and Scipio (see Figure 2.4-1). The Pahvant ranged westward into the deserts surrounding Sevier Lake during portions of the annual subsistence round, where they frequently overlapped with Goshute Shoshone. Their boundary with the Southern Paiute appears to have fluctuated through time, being initially defined as the Cove Creek area of Beaver River, and later as the Sevier Lake-Sevier Desert area.

Escalante's 1776 expedition encountered a Pahvant encampment of 20 persons some four days travel south of Utah Lake. The Pahvant are described as being bearded, dressed in rabbit-skin robes, and as wearing bone nose-pins. Little other historical data, however, are available for the period before Mormon settlement. Since rapid changes resulted from the almost simultaneous arrival of the horse and the Mormons, much of what is known about aboriginal and early historic Pahvant Ute occupation was gathered from Indian informants in the previous century.

The total aboriginal population of the Pahvant is estimated between 1,000 and 1,500. Each major winter village division, comprised of approximately 200 persons, was led by a civil chief who monitored the location of food resources and dispatched messengers in order to assemble all members in favorable gathering areas. Special chiefs were recognized for rabbit-drives, antelope-drives, fishing, dances, and warfare. All Pahvant divisions appear to have gathered together at the Sevier River for the annual spawning runs of mountain trout and suckers, during which the 10-day Bear Dance Festival was held. The Pahvant seem to have recognized a pan-village or paramount chief, but the degree of authority exercised by this official in prehistoric times is not known.

The Pahvant were displaced from most of the six village division sites by Mormons in the 1850s. With the aid of horses, they began to gather in large nomadic bands to facilitate survival. Kanosh, a contemporary of the Timpanogots Chief Wakara, arose as paramount chief of the Pahvant. His war chief, Moshokuop, and 50 Pahvant warriors were responsible for the massacre at Gunnison in 1853. By 1860, the Pahvant occupied the Sevier Lake area to the west, and the Corn Creek area to the east, of their original winter village sites (now occupied by Mormon settlers). Kanosh, after whom the modern town is named, was recognized as the Pahvant chief through the 1870s. His following, however, had been diminished by the exodus of Pahvants to the Uintah Basin and to the ranks of Black Hawk during the 1865-1870 war against the settlers.

Ute Occupation and the Deployment Suitability Area

It appears that by 1870, the majority of Timpanogots and Pahvant Utes who had escaped death from starvation or warfare had emigrated to the Uintah Basin. There they amalgamated with Utes from other areas of the state and became collectively known as Uintahs. According to Steward (1938:222), some Pahvant families still resided at Kanosh in the mid-1930s, but had intermarried extensively with Southern Paiutes and were too young to recall much of the older culture. Southern Paiutes are now dominant in this area of the state, and it is doubtful that Utes who identify themselves as either Timpanogots or Pahvant now reside in any numbers near the proposed M-X deployment area. The bulk of their descendants live today on the Uintah and Ouray Reservation.

The historical data indicate that extensive western Ute archaeological sites are likely to exist in specific areas now under consideration for M-X deployment. These areas are summarized in Table 2.4-1.

SOUTHERN PAIUTE (2.4.2)

The Southern Paiute people, or Nuwuvi, occupied an extensive territory which included portions of southeastern Nevada, southern Utah, northern Arizona, and southeastern California. In aboriginal times, several distinct political groups, or bands, were identified with particular regions within this area. Each band consisted of family groups which individually or jointly occupied permanent winter settlements at specific streams or springs. Family groups in each band were welded by common territory, communal subsistence pursuits, frequent visitation, and joint celebration of traditional ceremonies and dances. Aboriginal political institutions reflected the Southern Paiute emphasis on individual freedom and autonomy. Bands were informally structured by a council of elders which convened to decide matters

Table 2.4-1. Probable location of Western Ute archaeological site concentrations in the Utah study area.

LOCATION	UTE GROUP	PROBABLE SITES	ASSOCIATION
Tintic Valley	Timpanogots	Villages	Territory of a major division of Timpanogots
Sevier River (Deseret to Sevier Lake)	Pahvant	Villages	Territory of a major division of Pahvants; major area for communal fishing and hunting of waterfowl.
Sevier Lake (dry)	Pahvant	Campsites, Prehistoric Settlements	Prehistoric gathering area of Pahvants; refugee occupation area for equestrian Pahvant bands in 1860; prehistoric fishing camps or villages expected on old lake shoreline.
Beaver River	Pahvant	Villages	Territory of major division of Pahvants; historic village in Black Rock area; prehistoric villages expected along entire drainage.
House Mountains	Pahvant	Campsites	Pine-nut gathering area; excursions made for favored nut of <i>Pinus monophylla</i> unavailable elsewhere in Pahvant territory.

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and organize activities involving their entire memberships. Leaders of band communal ventures, such as rabbit-hunt or festival chiefs, were chosen for their special abilities or spiritual powers but had only limited and temporary authority. Leaders of individual family or local groups, who directed seasonal movements and subsistence endeavors, were typically selected by the larger band council and had similarly limited power. The Southern Paiute recognized no common authority above the band level, but shared a common cultural identity and relationship to traditional lands.

The Southern Paiute differ from neighboring Ute bands in two important respects. First, all local groups were dependent to a greater or lesser extent on horticulture from prehistoric times. Crops such as corn, beans, squash, pumpkins, and sunflowers were cultivated in irrigated plots near streams or springs on a seasonal basis. This subsistence base supported fairly dense population concentrations along the Virgin, Santa Clara, and Muddy rivers, and other perennial streams. Second, due to the inadequacy of forage in these more southern latitudes, the development of equestrianism was very limited in historic times. The pedestrian nature of Southern Paiute bands and the permanency of winter settlements and associated farming plots made them susceptible to attack, enslavement, and territorial displacement by non-Indian and Indian predators.

Aboriginal Distributions

The Southern Paiute recognize nineteen major band divisions which were associated with distinct regional provinces in Nevada/Utah and adjacent portions of California and Arizona. These bands appear in Figure 2.4-2.

The northern boundary in Utah claimed by Southern Paiutes overlaps with southern historic boundaries documented for the western Ute. The northern movement of the Kwumpits and Koosharem Paiutes began after 1850 when the majority of Utes emigrated to the Uintah Basin. The 1776 Escalante expedition, penetrating Southern Paiute territory from the north, recorded its first encounter with Kwumpits bands at a point 12 mi (19 km) south of Minersville, Utah. This northern extent corresponds to aboriginal Southern Paiute distributions outlined by Kelly (1934).

Escalante met Utah Southern Paiutes at Coal Creek, Ash Creek, and in the vicinity of modern Hurricane. Cultivated fields, well-constructed irrigation systems, and large quantities of crops were reported during this earliest encounter, particularly in the Ash Creek area. Following the Escalante expedition, large numbers of Spanish fur trappers and traders entered the Salt Lake, Utah Lake, and Uintah Basin areas. The Indian slave trade, which was to have devastating effects on the Southern Paiute population, appears to have begun at this early date. The first recorded instance of slaving was the 1813 expedition of Arze and Garcia. The Ute were actively involved by this period, raiding Goshute and Southern Paiute settlements for captives and selling them to New Mexican traders.

By the mid-1820s, Anglo trappers and traders began to penetrate Southern Paiute territory in an effort to establish a route between New Mexico and the Pacific. The 1826 expedition of Jedidiah Smith passed along the Santa Clara River. The area was referred to as Corn Creek, after the extensive farming villages on its banks. Smith successfully linked segments of the Escalante route with a 1776 road

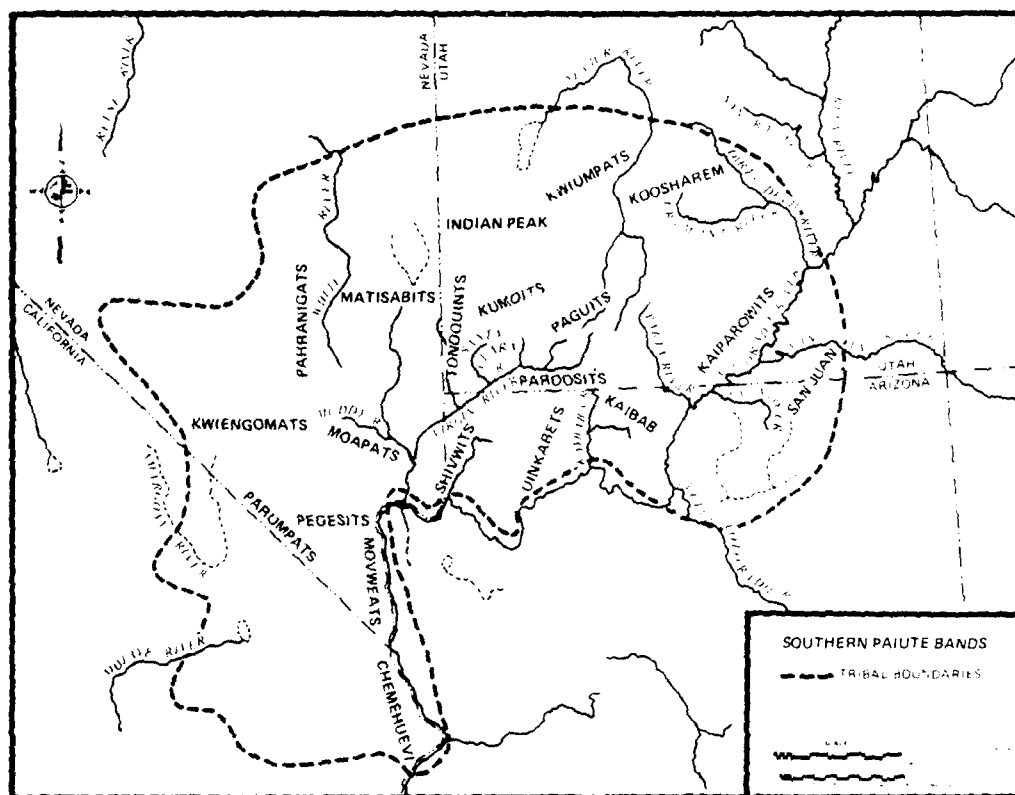


Figure 2.4-2. Historical distribution of the Southern Paiute bands (after Kelly, 1934).

across the Mojave Desert to California established by Garcés. The east-west route known as the Old Spanish Trail was thereby formed, and came into general use by 1830.

Heavy traffic along the Old Spanish Trail (see Figure 2.4-3) dealt the first major destructive blow to the Southern Paiute environment, settlement pattern, and subsistence. Large caravans were an annual occurrence between 1830 and 1848. The route was utilized by three major categories of travelers: (1) Mexican slaving expeditions, (2) Ute horse- and slave-raiding expeditions, and (3) Anglo-American traders, adventurers, and military parties. Caravans often averaged 200 men and 2,000-4,000 head of livestock (horses and mules) each in size. Foliage along the entire length of the Old Spanish Trail was decimated by both animal traffic and overgrazing. Such grasses were a major source of Southern Paiute subsistence. Moreover, perennial streams and springs, as favored camping areas, were totally monopolized by successive expeditions from late spring to early fall. These well-watered areas were utilized for farming during the same season by Southern Paiutes. Incidences of trespass and of expedition camping in Paiute cornfields became commonplace. The outnumbered, under-equipped, and basically non-militaristic Paiutes could offer little organized resistance to the destruction of their basic food supplies.

In addition to the effects of expeditions flowing along the trail, Southern Paiutes were also plagued by annual slave raids by both Ute war parties and Mexican slaving caravans. It is estimated that the Paiute lost approximately one-half of their children and young adults to slavers in the historic period preceding 1848. Since females brought higher prices than did males, and were taken in greater numbers, a severe sexual imbalance developed.

The period between 1830 and 1848 thus saw the total disruption of Southern Paiute population centers and subsistence patterns. Due to their displacement from favored farming areas by caravan encampments and to the fear of slaving parties, band members dispersed into the countryside in small groups. Food shortages became acute. Whereas Mexican caravans tended to be totally avoided by Paiutes due to their large size and slaving propensities, smaller Anglo-American wagon trains were often followed or confronted with a show of numbers. Starvation forced some Southern Paiutes to adopt horse-raiding or the ambushing of other wagon train livestock for food. Anglo-Americans generally responded with indiscriminate acts of retribution, and in some instances with the hunting of Indians for sport.

By 1848, the presence of U.S. military patrols along the Old Spanish Trail had effectively ended the era of large Mexican slaving caravans. As the constant threat of attack and abduction diminished, Southern Paiutes began to reoccupy perennial streams, such as the Santa Clara River, Muddy River, Virgin River, and Beaver Dam Wash area, for irrigation farming. Sporadic slave raids by Ute bands, however, continued for the next decade. Southern Paiute attempts to return to their aboriginal population centers and subsistence activities were further complicated by the discovery of gold in California in 1849. A new wave of Anglo-American wagon trains flooded the Old Spanish Trail, inflicting further damage on the Southern Paiute countryside. Incidences of trespass and the utilization of Indian lands for encampments and livestock forage led to hostilities and renewed displacement of Southern Paiutes from well-watered areas.

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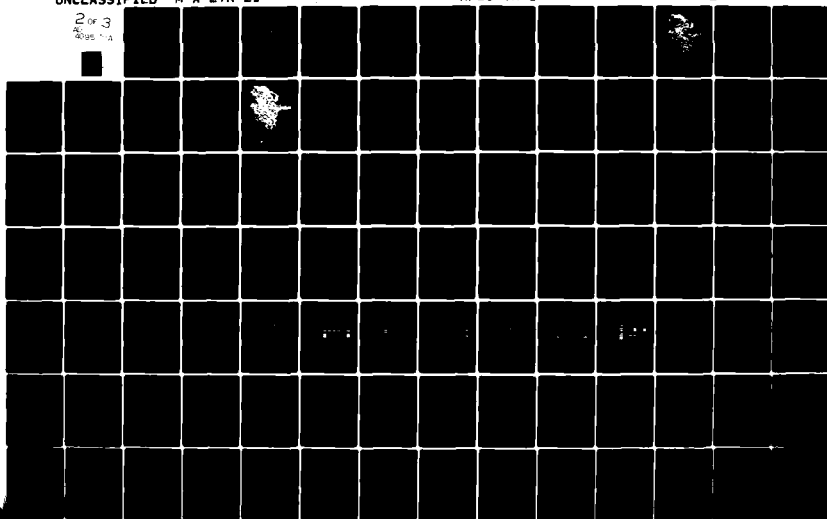
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In the same year, 1849, the Mormon Church sent an exploratory expedition to Southern Paiute territory to select an area for settlement.

Mormon Settlement and Territorial Usurpation

As in former Ute lands, Mormons were attracted to the same environmental areas which had been selected by indigenous Indians for settlement. The Church referred to Indians as "Lamanites," and embodied the philosophy that they had once been Christians, and that they must be returned to the Faith. Taking over choice Southern Paiute farmlands, Mormon pilgrims established their first settlement at Parowan in 1850. Subsequent missions were built at Fort Harmony in 1854, Las Vegas and Santa Clara in 1855, St. George in 1861, and Meadow Valley and Callville in 1864. The Mormon Church maintained a paternalistic attitude toward Southern Paiutes, defining themselves as civilizing and enlightening agents, and guardians of Indian welfare. Once again displaced from their original farmlands, and their countryside denuded of food grasses by settler livestock, starving Southern Paiutes in Utah began to radiate to Mormon farms and ranches to serve as laborers and sharecroppers. Others moved westward, where resistance to Mormon settlement and conversion were greater, to join other Southern Paiute bands.

The Mormon Church played a major role in terminating the Indian slave trade by Mexicans and Utes. Contemporary Southern Paiute historical interpretations, however, suggest that the underlying motivation of this effort was self-serving (Inter-Tribal Council of Nevada, 1976a:56-89). According to this source, Mormon efforts to end the trade were designed to eliminate the very real political threat of a Ute-Mexican military alliance against the Church, and simultaneously to monopolize the Indian labor market for themselves. Indeed, the 1852 Act for Relief of Indian Slaves and Prisoners established a legal institution of indentured servitude, wherein Mormons were permitted to "adopt" Indian children for up to twenty years. Many Southern Paiute children were thus channeled into domestic and farm labor, and were subject to purchase and resale as chattels.

By the late 1850s, as conflict escalated between the Mormons and U.S. government, the church allegedly made numerous attempts to win the alliance of Southern Paiutes against gentile miners and wagon trains. Numerous acts of aggression and retaliation between Indians and the expanding population of Anglo-American intruders were reported over the next several years.

Peace was established by the U.S. government in 1865, but no lands were set aside at that time for the strife-torn and homeless Southern Paiutes. Paiute farmlands along perennial streams in Utah had been completely usurped by settlers. Although areas along the Muddy River, Colorado River, and at various springs in Nevada continued to be cultivated on a limited scale, the vast majority of Southern Paiutes had, by 1869, been reduced to indigence and vagrancy.

The Moapa Reservation was officially established in 1872 and expanded in 1874 to include approximately 4,000 mi² (10,360 km²) in southeastern Nevada. This large reserve, which was intended for resettlement of several Southern Paiute bands, was drastically reduced to only 1,000 acres (400 ha) in 1875 (see Figure 2.4-4).

Due to repeated mismanagement and the illegal use of both funds and land by reservation officials, Southern Paiute occupancy of Moapa was delayed for over a

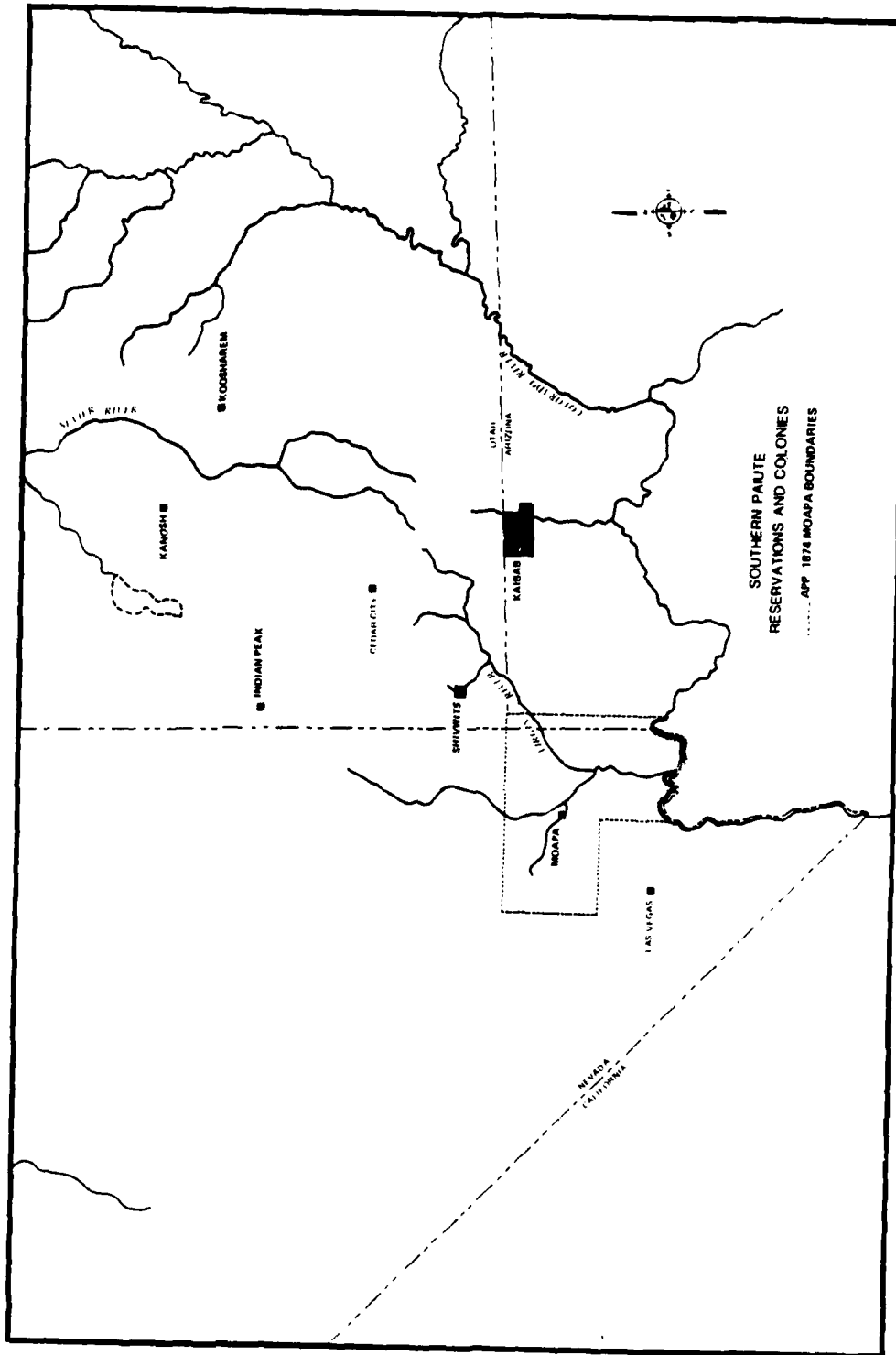


Figure 2.4-4. Southern Paiute reservations and colonies (after Inter-Tribal Council of Nevada, 1976a).

quarter of a century. In the interim, Nevada bands clustered on the fringes of white settlements in the upper Meadow Valley, lower Muddy River Valley, and Las Vegas. A ten-acre (4 ha) parcel was purchased for the Las Vegas Colony in 1911.

Utah Southern Paiutes, totally dispossessed of farmland, were forced to migrate to white settlements for wage labor. Santa Clara and Virgin River Paiutes resettled at both Muddy River and Cedar City until the Shivwits Reservation was established in 1903. Lands for the Indian Peak Paiutes were set aside in 1915. Cedar City Southern Paiutes in 1917 established a colony on land owned by the Mormon Church. The northernmost Utah bands joined remaining Ute families at Koosharem and Kanosh, which were converted to reservations in 1928 and 1929, respectively.

Southern Paiute Occupation and the Deployment Suitability Area

The area currently under consideration for M-X deployment falls in the aboriginal territories of five historic Southern Paiute bands. These are: in Nevada, the Pahrnagits, Matisabits, and Moapits; and in Utah, the Kwumpits and Indian Peak bands (see Figure 2.4-2).

The members of all Southern Paiute bands ranged over considerable distances during the annual subsistence cycle. Campsite remains may therefore be expected to have a wide distribution. The major population centers of each band, however, consist of permanent winter settlements. These latter archaeological remains are in some areas extensive, and have a higher potential for sensitivity among contemporary Indians. These areas are summarized in Table 2.4-2.

In Nevada, descendants of the Pahrnagits, Matisabits, and Moapits bands now reside at the Moapa Reservation and Las Vegas Colony. All Southern Paiute reservations in Utah were terminated from federal trust status in 1957. Members of the Indian Peak band were forced to sell their former reservation lands in order to settle accumulated real estate taxes levied on the property since termination. The majority of Indian Peak peoples now reside in Cedar City Colony. Descendants of the Kwumpits band blended with remaining Pahvant Ute families, and live at Kanosh and nearby Richfield. All of these Utah Southern Paiute bands have recently been reinstated to federal trusteeship (Figure 2.4-3).

WESTERN SHOSHONE (2.4.3)

The Shoshone, or Newe, originally occupied a large area covering major portions of central and northeastern Nevada, northwestern Utah, and adjacent areas of southern California, Idaho, and Wyoming. The Western Shoshone division typically refers to the Nevada, Utah, and California peoples. The aboriginal territory of the western division includes approximately 24 million acres (9,600,000 ha), a significant portion of which is considered geotechnically suitable for M-X deployment. Of all Nevada/Utah Indians, therefore, the Western Shoshone may experience the most substantial impacts to cultural and natural resources.

In aboriginal times, all areas of this vast territory were exploited for food on a seasonal basis. Local sociopolitical organization, while structured on consistent cultural principles, seems to have varied in relative size and complexity according to local ecological conditions. In general terms, specific land areas or subsistence

Table 2.4-2. Probable location of Southern Paiute site concentrations in the Nevada/Utah study area.

LOCATION	BAND	PROBABLE SITES	ASSOCIATION
Pahranagat Valley	Pahranagits	Winter Settlements, Historic Sites	Center of Pahranagits permanent occupation sites. Potential battle or massacre sites from the 1855-1865 period.
Meadow Valley Wash	Matisabits	Winter Settlements, Historic Sites	Population center of Matisabits band, particularly in the northern end of the Valley near Panaca and Pioche. Potential battle sites from the 1855-1865 period.
Muddy River Valley	Moapits	Winter Settlements	Center of Moapits band and one of the most densely settled areas in Southern Paiute territory; occupation sites extend along entire length of river and southern end of Meadow Valley Wash.
Indian Peak	Indian Peak	Winter Settlements	Concentration of permanent settlements located at foot of Indian Peak; additional sensitive areas probable in adjacent Needle Range.
Beaver River Valley	Kwiumpits	Winter Settlements	Central territory of Kwiumpits band; sites expected along length of river valley from the Cove Creek area to Beaver City area; known historic population concentration at foot of Tushar Mountains.

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ranges were recognized throughout Shoshone territory, and were often named after prominent resources in the district. Since families in the same district tended to exploit the same areas for food, and to join together seasonally for communal gathering, hunting, and ceremonial activities, district names were also applied to persons residing there. Thus, for example, the Ruby Valley Shoshone were referred to as Wadaduka ("rye grass seed-eaters"), and the Duckwater Shoshone as Tsaiduka ("tule-eaters"). Seasonal occupation sites returned to annually included summer camps near mountain springs, utilized during gathering and fishing; and winter villages in foothill or pine-nut areas.

Due to the considerable environmental and political disruption of the early historic period, it is difficult to determine whether these Shoshone regional divisions were, in aboriginal times, autonomous units or bands with consistent cross-generational memberships. Later ethnographic descriptions indicate considerable fluidity in family-regional affiliations based upon the fluctuating seasonal and annual availability of native foods in given areas. It is likely that sociopolitical groups approximating true bands were found in areas with stable and abundant seasonal resources, whereas less favorable regions with less predictable food sources encouraged greater horizontal mobility of component family units and periodic fluctuations in group membership. The mass destruction of native foods by intruders in the early historic period may account for the apparent dominance of family mobility and autonomy as opposed to older, more stable organizational structures.

As among the Ute and Southern Paiute, Shoshone leadership was consensual and nonhierarchical. Civil chiefs of villages, or at times groups of villages, generally coordinated the flow of essential seasonal subsistence activities. Several other chiefs, chosen for their wisdom and special abilities, led antelope hunts, rabbit hunts, festivals, and dances. Charismatic, militaristic chiefs who rose to prominence during the early historic period deviated from the aboriginal pattern, and represent an adaptive response to armed invasion.

Since some of the best ecological niches and areas of population density were destroyed during the earliest period of intrusion by outsiders, an accurate picture of aboriginal occupancy and lifestyle is perhaps best viewed through the historical process as documented by the Shoshone themselves (Inter-Tribal Council of Nevada, 1976b). These data will then be compared with 1930s information gathered from Shoshone elders by Steward (1938) which documents the location of rural village, camp, and festival sites circa the 1880 period.

Ethnohistorical Overview

The Humboldt River area of Shoshone territory, once rich with tall grasses, abundant game, and waterfowl, provided a natural east-west passageway across north-central Nevada. The very features which made this region a major population center for Shoshones were also a natural attraction for traders, emigrant trains, and eventually foreign settlers. The Humboldt River corridor was to become a major link in a northern overland route from Salt Lake City to California (see Figure 2.4-3). The deleterious environmental and human effects experienced by the Shoshone were in many ways parallel to those documented for Southern Paiutes along the Old Spanish Trail.

Fur trappers were the first to invade Shoshone lands, beginning in 1827 with the expedition of Jedidiah Smith. Peter Odgen, accompanied by an entourage of

trappers and a large number of horses, traversed the Humboldt from west to east in the fall of 1828, and from east to west in the spring of 1829 (Ogden, 1911). On these two brief expeditions, Ogden's party extinguished the riverine beaver population, on which the Shoshone depended for food and clothing. Moreover, trapper horse herds denuded the land of valuable seed grasses along the river, and seriously depleted game animals in the area. Shoshones, described as friendly and inhabiting villages along the Humboldt in 1826, had by the following spring adopted a policy of avoidance. As this and successive trapping parties passed through their territory, Shoshones became increasingly alarmed and angered at the destruction of native flora and fauna, on which their survival depended.

The 1840s saw the development of the Humboldt River as a major wagon train route westward. A road passing from Salt Lake to Steptoe Valley, Ruby Valley, Wells, South Fork, Elko, and along the entire length of the Humboldt was established by 1841. Wagon trains after 1844 reported the disappearance of forage along the river, and the general paucity of game. More significantly, Shoshones, who were described earlier as robust and living in dense settlements, were now characterized as impoverished, wretched, and predatory on wagon train cattle. By the end of the decade new external events, such as United States acquisition of the west from Mexico, the Mormon arrival in Utah, and the discovery of gold in California, set the stage for foreign usurpation of Shoshone lands.

An estimated 100,000 people rushed to California in search of gold between 1848 and 1850, half this number utilizing the established trail through Shoshone territory. Deleterious environmental effects caused by the almost unbroken line of wagon trains were thereby magnified on a new scale. Their food and water supplies decimated, and some of their people murdered by unprovoked emigrant attacks, the Shoshone of the Humboldt River area organized for military retaliation. Unlike Southern Paiute territory, forage in northern Nevada and Utah allowed the limited keeping of horses and the development of mobile defensive forces. Rotating acts of violence became endemic.

After travelling extensively through the Humboldt River area from 1852-1853 and investigating Shoshone-White hostilities, U.S. Indian Agent Jacob Holeman concluded that Indian attacks were the direct result of imposed food shortages and deliberate provocations by lawless emigrants (Holeman, 1852). Mormon settlers and their livestock herds had also penetrated Shoshone territory, usurping the best lands for farming and husbandry. Although Agent Holeman recommended establishment of an agency along the Humboldt, and in good faith promised aid to the Shoshone, no such actions were taken, and Holeman was removed from office.

The new Indian Agent, Garland Hurt, successfully completed a peace agreement with Shoshones along the Humboldt in 1855, but this intended treaty was never ratified by the United States. Frustrated by this failure, a summer drought, and an unusually harsh winter, relations again deteriorated between Shoshones and the continuing waves of emigrants and settlers. One year after his appointment in 1858, a third agent, Superintendent Jacob Forney, attempted to establish an Indian reserve in verdant Ruby Valley, a favored winter gathering place for an estimated 1,500 Shoshone. Forney instructed the Ruby Valley leaders to summon other Humboldt River groups to the valley for settlement, and made promises of livestock and dry goods. These groups arrived to find that, after their traveling hundreds of miles, the promised gifts were nonexistent. Shoshones abandoned the Ruby Valley Reserve

when, in 1859, it became the site for a mail station and military troop depot, Fort Ruby. Indian depredations against travelers and settlers continued as a subsistence strategy. During this same period, Shoshones in interior Nevada south of the Humboldt remained comparatively isolated from Indian-White hostilities, and their environments relatively intact. Simpson's 1859 expedition, for example, which passed through the Diamond, Kobeh, and Reese River valleys en route to Genoa, recorded abundant game animals, plant foods, and numerous, friendly Indians (Simpson, 1876).

But this situation was to be short-lived. The decade of 1860-1870 saw the invasion and usurpation of Shoshone lands by thousands of emigrants, and marked one of the most brutal and devastating periods in Shoshone history. In 1861, foreign communication and transportation networks were firmly established with the completion of a telegraph line between Omaha and Sacramento, and the initiation of service by the Overland Mail and Stage Line. Shoshone lands were taken at will and without compensation by miners and homesteaders, and areas surrounding these settlements stripped of vital food sources such as pinyon trees and seed grasses. Ruby Valley, for example, was hunted- and fished-out by military personnel by 1861, and choice farming areas had been already claimed by settlers. Similarly, Reese River Valley had by 1863 drawn 3,000 miners, and livestock grazing by the Overland Stage had denuded the surrounding countryside. Displaced and without viable means of subsistence, Shoshones mounted attacks on mail stations and wagon trains. U.S. military troops, in a series of calculated acts of terrorism, retaliated with indiscriminate massacres of entire villages and of family groups encountered throughout the Shoshone countryside.

On October 1, 1863, representatives from the Western Shoshone agreed to a peace treaty which guaranteed, among other things, monetary payments and aid, and the establishment of land reserves for the Shoshone within their native territory. Fulfillment of the terms of this treaty remains a salient issue to the present day. Although peace prevailed following the agreement, neither governmental aid nor land allotments was forthcoming. Instead, settlers, industrialists, and businessmen laid claim to the choice parcels of Indian land, bringing with them diseases for which Shoshones had no natural immunities. Completion of the transcontinental railroad in 1869, a segment of which followed the Humboldt River, opened Shoshone lands to even greater numbers of outsiders.

Indian Agent Levi Gheen, exceptional for his compassion and knowledge of Shoshone language and culture, became an activist for Indian rights as outlined in the 1863 treaty. Gheen used his own funds to assist Indians at Duckwater and Elko in developing farms, and complained repeatedly to his superiors about the impoverished condition of Shoshones and their need for land reserves and equipment. Despite his political removal from office, Gheen continued to work and live among the Shoshone, and to utilize his influence with the white bureaucracy. Parcels on which Shoshones farmed throughout their territory were unsurveyed, and hence subject to possession by settlers. After attempts to remove the Shoshone to Idaho, and repeated requests for the establishment of Nevada reserves by Indian leaders, Gheen, and Paiute Agent C. E. Bateman, the Duck Valley and Carlin Farms Reservations were finally established in 1877.

After fourteen years of waiting since the 1863 treaty, more hardships beset the Shoshone. Reservation lands at Carlin Farms were turned over to whites in

1879, and the Indians removed. Duck Valley Reservation was neglected and mismanaged, and insufficiently developed to accommodate large numbers of Shoshones. Continued governmental attempts to remove all Shoshones to Idaho were successfully resisted, the majority choosing to remain in the areas originally occupied by their ancestors. There they managed to exist, largely by laboring for white ranches and businesses, until lands were finally set aside for them by the government. These included the Goshute Reservation (1914), Battle Mountain Colony (1917), Elko Colony (1918), Ely Colony (1931), Yomba Reservation (1937), Duckwater Reservation (1940), and South Fork Reservation (1941).

Shoshone Occupation and the Deployment Suitability Area

The majority of valleys regarded as geotechnically suitable for M-X deployment are part of Shoshone traditional lands. It is a reasonable assumption that all of these valleys, save those areas totally devoid of surface water, were occupied by the ancestors of contemporary Indians on at least a temporary basis. The best data available in the anthropological literature on specific occupation site locations were collected from Shoshone elders in the early 1930s by Julian Steward (1938). This information consists of rural Shoshone settlements recalled by informants from the 1870-1880 time period. Steward's findings are summarized in Figure 2.4-5.

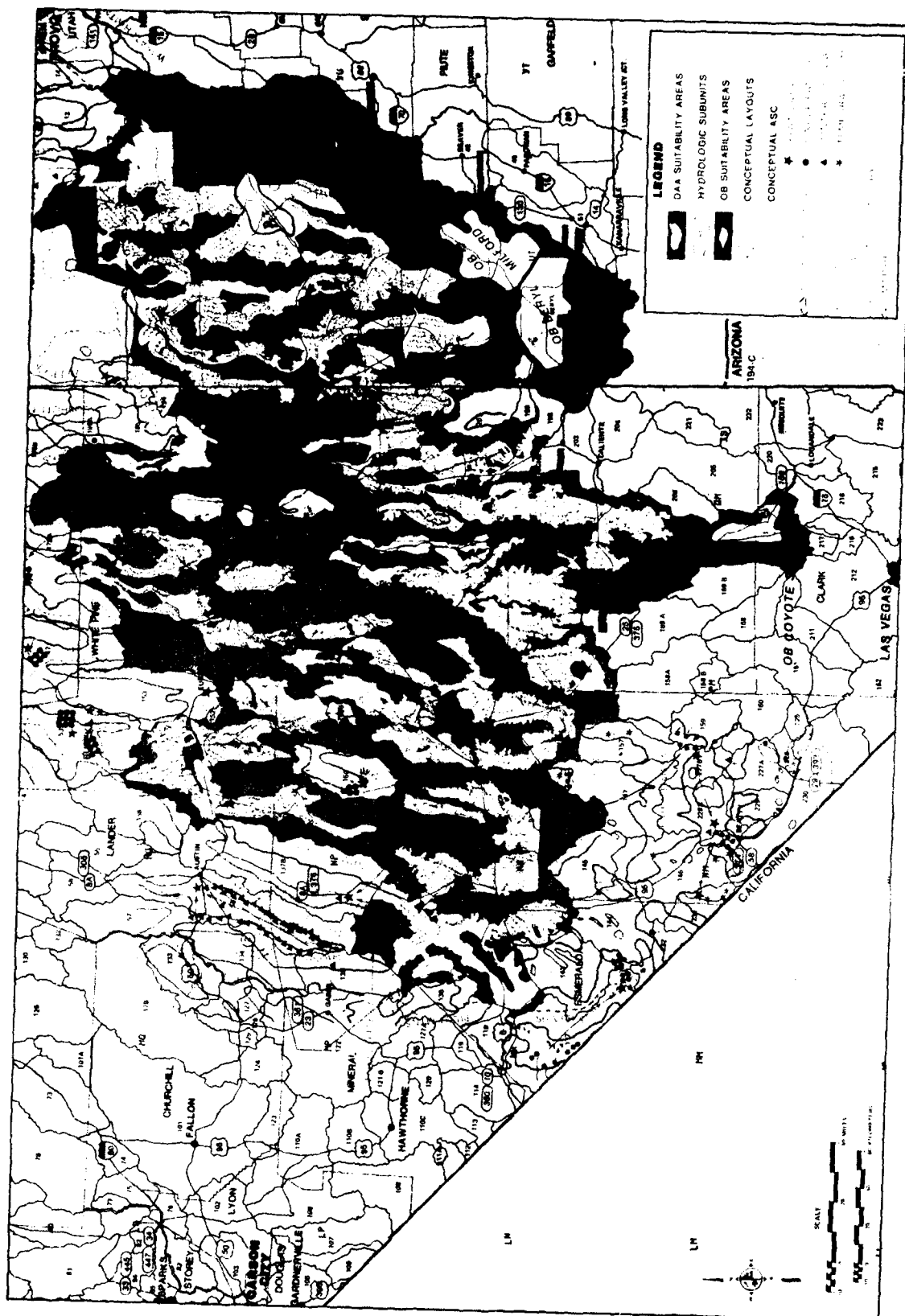
Although, as noted earlier, considerable disruption of Shoshone settlement patterns occurred after 1830, a profile of major population concentration areas may still be drawn from Steward's data. Greatest density in aboriginal times occurred along the Humboldt River and its tributaries. Extensive settlements are known for the following areas: Battle Mountain; Pine Creek, Diamond Valley; Independence Valley; the Palisade, Carlin, and Elko areas; Dixie Valley; Huntington Valley; and the North Fork, Halleck, Deeth, and Wells areas. A second area of known high density occurs to the southeast. Significant site concentrations are located in all stream and spring areas of the following regional cluster: Ruby Valley, Clover Valley, Spruce Mountains, Butte Valley, Long Valley, Pequop Mountains, Egan Canyon, Jakes Valley, and White Sage Valley. A third major Shoshone population center was found in the southern Reese River Valley. Over 40 distinct winter village sites in the foothills of the adjacent Shoshone and Toiyabe ranges were recalled by Steward's informant.

Areas of Shoshone territory south and east of these major population centers had fewer perennial streams and more scattered water sources. Population clusters were thus smaller and more unevenly distributed. Significant occupation is noted in northern and central Steptoe Valley, Railroad Valley between the towns of Hamilton and Nyala, and southern Snake Valley in the vicinity of modern Baker and Garrison. While the central Nevada region is less well documented, Shoshone occupation sites are expected in the vicinity of all springs and streams, particularly in the foothill areas.

While these known occupation sites represent only a small fraction of Shoshone ancestral places, the fact that they are within the living memory of informants accords them high sensitivity.

NORTHERN PAIUTE (2.4.4)

The Northern Paiute, or Numa, of Nevada occupied much of the remainder of the state west of Shoshone territory (see Figure 2.4-6). Although there appears to



have been much overlap with Shoshones on their eastern border, the division between these two groups along the Humboldt River is generally recognized as a point midway between the present towns of Battle Mountain and Winnemucca. Only a small portion of former Northern Paiute lands contain valleys currently under consideration for M-X deployment. These valleys are concentrated in Pershing County northwest and east of the Humboldt River.

Northern Paiutes in the vicinity of the Humboldt were nearly identical to Shoshones upriver in terms of general subsistence strategies and sociopolitical organization. Paiute subgroups or bands were named after the area in which they lived, which was often associated with a particular type of resource. The Koop Ticutta, for example, who occupied the Lovelock area, are Ground Squirrel Eaters, and the Toi Ticutta to the south, Tule Eaters. Northern Paiutes in the study area had a heavy dependence on aquatic resources such as fish, which spawned annually in the spring, and on waterfowl, which were taken by communal drives in the fall.

The territories of two historic Northern Paiute bands, the Koop Ticutta and Yamosopu Tuviwa ga yu, include valleys currently under consideration for M-X deployment (Inter-tribal Council of Nevada, 1976c). Indians in this area of the Humboldt Trail experienced the same environmental destruction, territorial displacement, and predation at the hands of trappers, emigrants, settlers, and the military as did the Shoshone. Forced to leave their ancestral lands, the Koop Ticutta joined other Paiute bands in the 1860 Pyramid Lake War against the intruders. Following the bitter five-year war, over which a peace treaty was never signed, the Koop Ticutta returned to the Lovelock area. Landless, and their natural foods destroyed, these Paiutes eked out a living through manual and domestic labor for whites. Two acres (0.8 ha) were set aside for residential use in 1907 by the government. Eighteen more acres (7 ha) were finally added to the colony in 1910. Due to this inadequate land allotment, Lovelock Paiutes continue to depend on outside labor for subsistence.

Northern Paiute bands north and west of the Humboldt were rounded up by U.S. military troops following the outbreak of the 1868 Bannock and Paiute War, and forced to march to the Yakima Indian Agency in southern Washington. Although some eluded capture and others made successful escapes, the majority of Paiutes, such as the Yamosopu Tuviwa ga yu, were detained far from their homelands until 1883. Upon their return, some joined the Fort McDermitt and Duck Valley Reservations, where their descendents live today.

Specific occupation site data for Northern Paiute bands in this segment of the study area are unavailable.

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3.0 THE DISTRIBUTION OF NATIVE AMERICAN RESOURCES

3.1 EXISTING CULTURAL AND RESOURCE DATA

Linguistic and ethnohistorical publications in the extant anthropological literature have provided information on the identity of aboriginal Indians in the study area, their former distributions, and the relative antiquity of these tribal groups in Nevada/Utah. Northern Paiute, Shoshone, Southern Paiute, and Ute Indians have occupied the study area for at least several centuries. A review of the extensive ethnographic literature on Great Basin Indians has provided data on aboriginal land use patterns, areas of population density, and traditional lifeways and cosmologies. Extensive ties with ancestral lands, and with the cultural resources they contain, have been maintained by contemporary Native American peoples.

Environmental features which continue to play an important role in Great Basin Indian traditional cultures are the following:

1. Native flora and fauna, which are utilized in the traditional manner for food, medicines, craft materials, and ceremonial objects; and which play a central role in traditional religious thought.
2. Sacred sites and areas, such as physiographic features associated with mystic times, burial and cremation sites, rock art sites, springs, and the dwelling-places of spiritual beings.
3. Traditional mineral resources, such as clay deposits utilized for pottery materials and the production of sacred paints, and stone deposits exploited for religious purposes.
4. Historic and archaeological sites, and ancestral artifacts.

While the existing literature has provided good documentation for the types of sites, features, and areas which are sacred or otherwise culturally sensitive to traditionalist Native Americans, locational data for these resources are poor. Extant site data for hydrologic subunits are summarized in Table 3.1-1. Due to the relatively small amount of archaeological field survey conducted in the Great Basin. Recorded sites are known to represent only a small portion of the total resource base.

Similarly, M-X studies have failed to provide necessary data on the nature and extent of contemporary Native American concerns for identified traditional cultural resources. For example, a mountain or cave which was regarded as sacred in the previous century may be held in greater or lesser reverence today. The persistence of cultural sensitivity regarding such sites has been emphasized by both BIA agency officials and in public statements issued by contemporary Native Americans, but the variable intensity of concerns for specific resource types cannot be documented on the basis of currently available information.

The cultural resources of Northern Paiutes, Shoshone, Ute, and Southern Paiute peoples are distributed throughout possible deployment areas in Nevada/Utah. Known Native American sensitive areas appear in Figure 3.1-1 (the precise locations of sites have been deliberately obscured to ensure their protection).

Table 3.1-1. Known Native American cultural resource sites in the deployment suitability area* (page 1 of 2).

	HYDROLOGIC UNIT	HABITATION/ BURIAL	ROCK ART	HOT SPRINGS	TOTALS
47	Huntington	21	0	4	25
53	Pine	21	0	0	21
54	Crescent	X	0	9	9
55	Carico Lake	X	0	0	0
56	Upper Reese River	41	0	0	41
57	Antelope	X	0	0	0
58	Middle Reese River	X	0	2	2
101	Carson Desert	X	12	X	12
101A	Carson Desert-Packard	X	0	0	0
122	Gabbs	X	0	0	0
124	Fairview	X	0	0	0
125	Stingaree	X	0	0	0
126	Cowkick	X	0	0	0
127	Eastgate	X	0	0	0
128	Dixie	X	0	13	13
129	Buena Vista	X	0	2	2
132	Jersey	X	0	1	1
133	Edwards Creek	2	0	0	2
134	Smith Creek	X	0	8	8
135	Ione	X	0	0	0
136	Monte Cristo	X	0	0	0
137A	Big Smoky: Tonopah Flat	3	0	0	3
137B	Big Smoky: Northern	9	1	3	13
138	Grass	X	0	0	0
139	Kobeh	X	0	4	4
140A	Monitor: Northern	X	3	3	6
140B	Monitor: Southern	4	0	0	4
141	Ralston	3	1	0	4
142	Alkali Spring (Esmeralda)	1	1	1	3
143	Clayton	X	0	1	1
144	Lida	4	0	0	4
145	Stonewall Flat	1	0	0	1
148	Cactus Flat	3	0	0	3
149	Stone Cabin	18	0	2	20
150	Little Fish Lake	7	0	1	8
151	Antelope	1	0	1	2
152	Stevens Basin	X	0	0	0
153	Diamond	3	0	0	3
154	Newark	6	0	0	6
155A	Little Smoky: North	2	0	0	2
155B	Little Smoky: Central	X	0	0	0
155C	Little Smoky: South	2	1	0	3
156	Hot Creek	22	0	1	23
158A	Emigrant (Groom Lake)	X	0	0	0
169A	Tikaboo: North	1	0	0	1
170	Penoyer	1	0	0	1
171	Coal	4	1	0	5
172	Garden	4	1	0	5
173A	Railroad: South	X	1	0	1
173B	Railroad: North	23	2	7	32
174	Jakes	8	0	0	8

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Table 3.1-1. Known Native American cultural resource sites in the deployment suitability area* (page 2 of 2).

HYDROLOGIC UNIT		HABITATION/ BURIAL	ROCK ART	HOT SPRINGS	TOTALS
175	Long	4	0	0	4
176	Ruby	60	0	0	60
178A	Butte: North	10	0	0	10
178B	Butte: South	X	0	1	1
179	Steptoe	23	1	0	14
180	Cave	7	0	0	7
181	Dry Lake	8	0	0	8
182	Delamar	4	1	0	5
183	Lake	6	0	0	6
184	Spring	22	4	8	34
185	Tippett	3	1	0	4
186A	Antelope: Southern	X	0	0	0
186B	Antelope: Northern	8	0	0	8
187	Goshute	11	0	0	11
194	Pleasant	3	0	0	3
196	Hamlin	4	0	0	4
198	Dry	1	5	0	6
199	Rose	X	4	0	4
200	Eagle	2	3	0	5
201	Spring	7	2	0	9
202	Patterson	2	0	0	2
203	Panaca	3	3	0	6
204	Clover	11	2	0	13
205	Lower Meadow Valley Wash	4	8	0	12
206	Kane Springs	2	0	0	2
207	White River	1	0	4	5
208	Pahroc	2	5	0	7
209	Pahranagat	22	10	3	35
210	Coyote Spring	3	0	0	3
216	Garnet	X	0	0	0
217	Hidden: North	X	0	0	0
218	California Wash	1	0	0	1
219	Muddy River Springs	2	1	2	5
220	Lower Moapa	X	0	0	0
221	Tule Desert	X	0	0	0
222	Virgin River	X	X	0	0
3	Deep Creek	4	X	0	4
4	Snake	17	3	0	20
5	Pine	1	6	3	10
6	White	19	2	0	21
7	Fish Springs Flat	5	0	0	5
8	Dugway	X	0	0	0
9	Government Creek	2	2	0	4
13	Rush	X	0	1	1
46	Sevier Desert	7	5	0	12
46A	Sevier Desert: Dry Lake	1	1	0	2
50	Milford	X	0	8	8
52	Lund	X	0	0	0
53	Beryl-Enterprise District	6	1	0	7
54	Wah Wah	X	0	0	0
TOTALS		513	94	93	700

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*X indicates that site densities are presently undetermined.

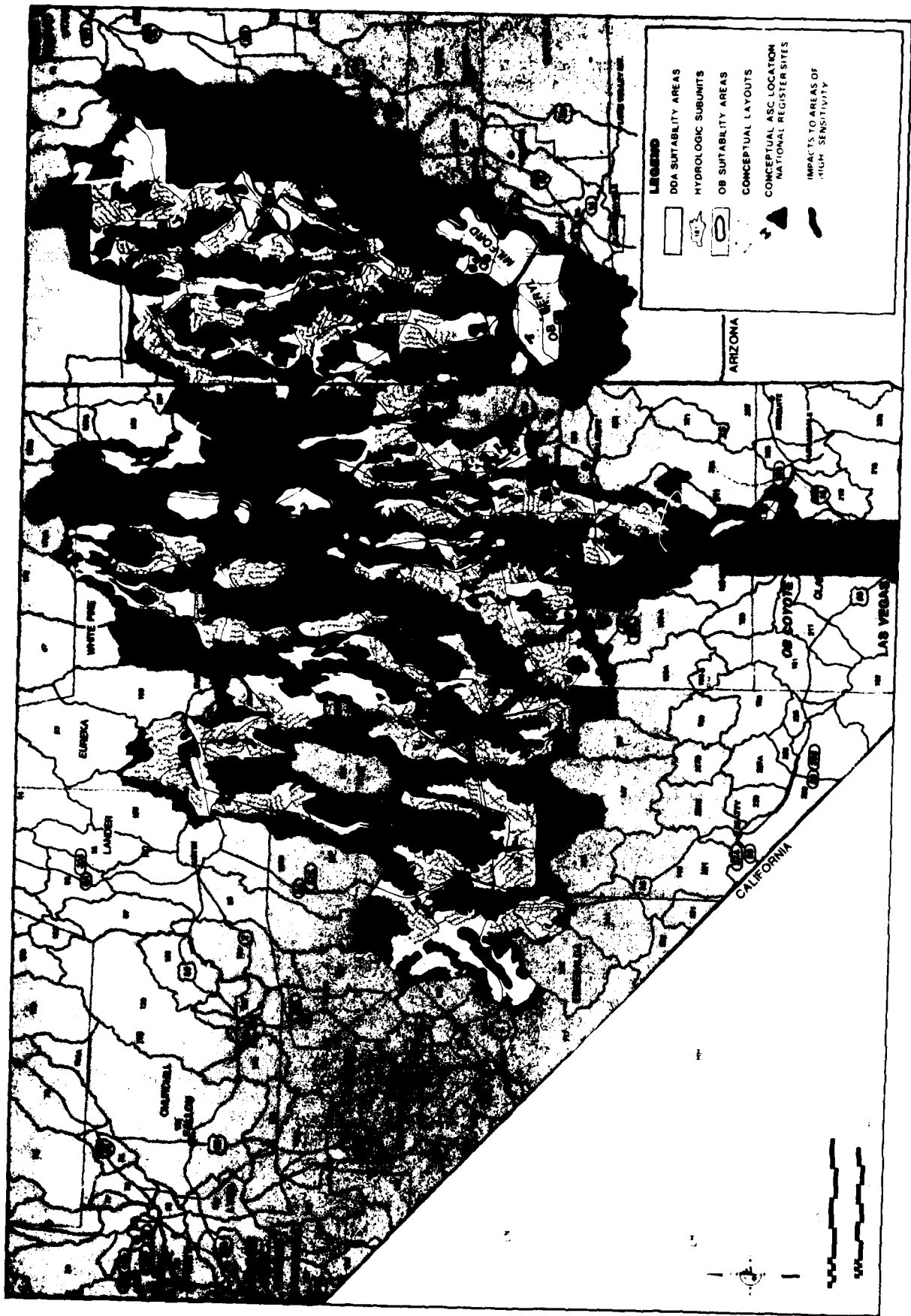


Figure 3.1-1. Known Native American sensitivity areas in Nevada/Utah.

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National Register sites and eligible properties which are likely to be sensitive to Native Americans include ancestral winter village sites, historic occupation sites, and historic event sites such as birth and death places of important tribal personages, and battle or massacre sites. Important archaeological remains are expected with greatest frequency in foothill areas and along present or former water sources such as perennial streams, lakeshores, and springs. Locational data on Native American historic event sites and settlements are generally unavailable in the extant literature.

Sacred sites include burial grounds, cremation areas, rock art, ceremonial/ritual sites, special caves and springs, and selected physiographic features which are accorded significance in traditional cosmologies. Burial areas, caves, and prominent physiographic features generally occur in foothill and mountain areas, and are therefore more subject to direct impacts by transportation and utility corridors than by OB and DDA facilities. Historic burials, however, are common in valley floor regions near former settlements associated with non-Indian Rock art in the Nevada/Utah area is typically associated with natural draws and canyons, springs, water tanks, and caves. These sites, which are also eligible for National Register status, do occur in some valley areas currently under consideration for deployment.

Sacred resources sensitive to Native Americans include a wide variety of fauna which have symbolic religious content in traditional cosmologies. Virtually all native species are so regarded, and special supernatural significance is accorded all varieties of eagles. Faunal materials such as feathers, hides, ears, hooves, and other bone matter are utilized for the production of sacred ritual objects. Critical animal habitats in the study area are therefore an area of overlap between biological and Native American cultural impacts.

A second such area of overlap concerns sensitive Native American gathering areas. Most prominent in this category are pinyon groves which are generally distributed in areas above 5,000 ft (1,500 m) in altitude in northern latitudes, and above 6,000 ft (1,800 m) in southern latitudes of the study area. Valley and foothill areas continue to be exploited for a wide variety of native flora utilized for medicinal preparations. The deployment area also contains traditional basketry materials such as willows, tule, and devil's claw. These lowland riparian species are subject to direct impacts from construction activities and water depletion.

Inorganic cultural resources gathered in the study area include clays for pottery and paints, and a variety of stone materials for pottery temper, medicine bags, and other sacred uses. Clay and stone deposits which continue to be utilized by Native Americans in the study area have not been specifically identified in the literature.

3.2 EXISTING SOCIOECONOMIC RESOURCE DATA

The basic theoretical premise of the technical study is that contemporary Native Americans are "persistent peoples" who have resisted political, demographic, linguistic, ecclesiastical, and economic incorporation into the larger American society. Cultural persistence has been maintained through the preservation of distinct languages, customs, rituals, and cosmologies. Such persistence has also been greatly facilitated by the physical segregation of Native Americans on reservations, and by the independent political structures which have evolved on these

reserves to promote and protect community interests vis a vis outsiders. Survival as distinct peoples has thus come to require two interdependent strategies: contrastive enculturation of children, and physical segregation in economically viable communities.

When viewed in this context, the cultural resources of contemporary Native Americans include not only native flora and fauna, sacred areas, and archaeological remains, but a wide variety of natural and human resources which promote the growth, welfare, and independence of their communities. Systematic investigation of these issues is currently in progress. At least four areas of potential impacts appear directly relevant to M-X deployment.

LAND (3.2.1)

The majority of Indian reservations in the study area have insufficient land resources for economic development. In the case of existing colonies, land use is largely residential. Although some of these small urban reserves have been able to devote limited space to the development of small industrial parks, tribal members are dependent upon external wage labor for subsistence. Rural reservations, which depend to a significant extent on ranching enterprises, are hampered both by available acreage and problems relating to aridity. While these Indian lands have been excluded from consideration for M-X deployment, project facilities may be located as close as one mile (1.6 km) from reservation boundaries. Potential conflicts may therefore arise over lands within a larger radius of Indian reservations which are of present or future economic importance to these communities.

Grazing Land. In addition to the more than 482,000 acres (192,800 ha) of reservation land in the Nevada/Utah study area, there are an estimated 660,397 acres (264,159 ha) for which BLM grazing permits are held. These are the Duckwater, Odger's, and Yomba grazing allotments.

The Duckwater reservation Indians in central Nevada hold BLM grazing permits on about 352,000 acres (140,800 ha). The area is poorly described, however, and BLM and BIA descriptions of the grazing area conflict. The BIA has estimates which range from 6,000 to 800,000 acres, according to the Duckwater attorney, while the BLM has supplied the tribe with three descriptions of the allotment of about 350,000 acres, but boundary descriptions are divergent. The general area of the BLM description lies in four hydrologic subunits: Little Smoky-North, Little Smoky-Central, Little Smoky-South and Railroad-North (Figure 3.2-1).

The lands for which the Duckwater Shoshone hold BLM permits correspond to those which the tribe proposes to withdraw. The request was filed in 1977; and is currently being processed by Department of the Interior Agencies (Facilitators, 1980).

The Te Moak Shoshone have a total of 40,000 acres in federal grazing land allotments in the South Fork and Odger's Ranch regions. The acreage near South Fork lies totally within the Dixie Creek and Tenmile Creek basin just to the north of the study area. The Odger's ranch allotment is in four basins: Butte-North, Butte-south, Ruby, and Long. The areas involved in these two portions of the Te Moak allotment are indicated in Figure 3.2-1.

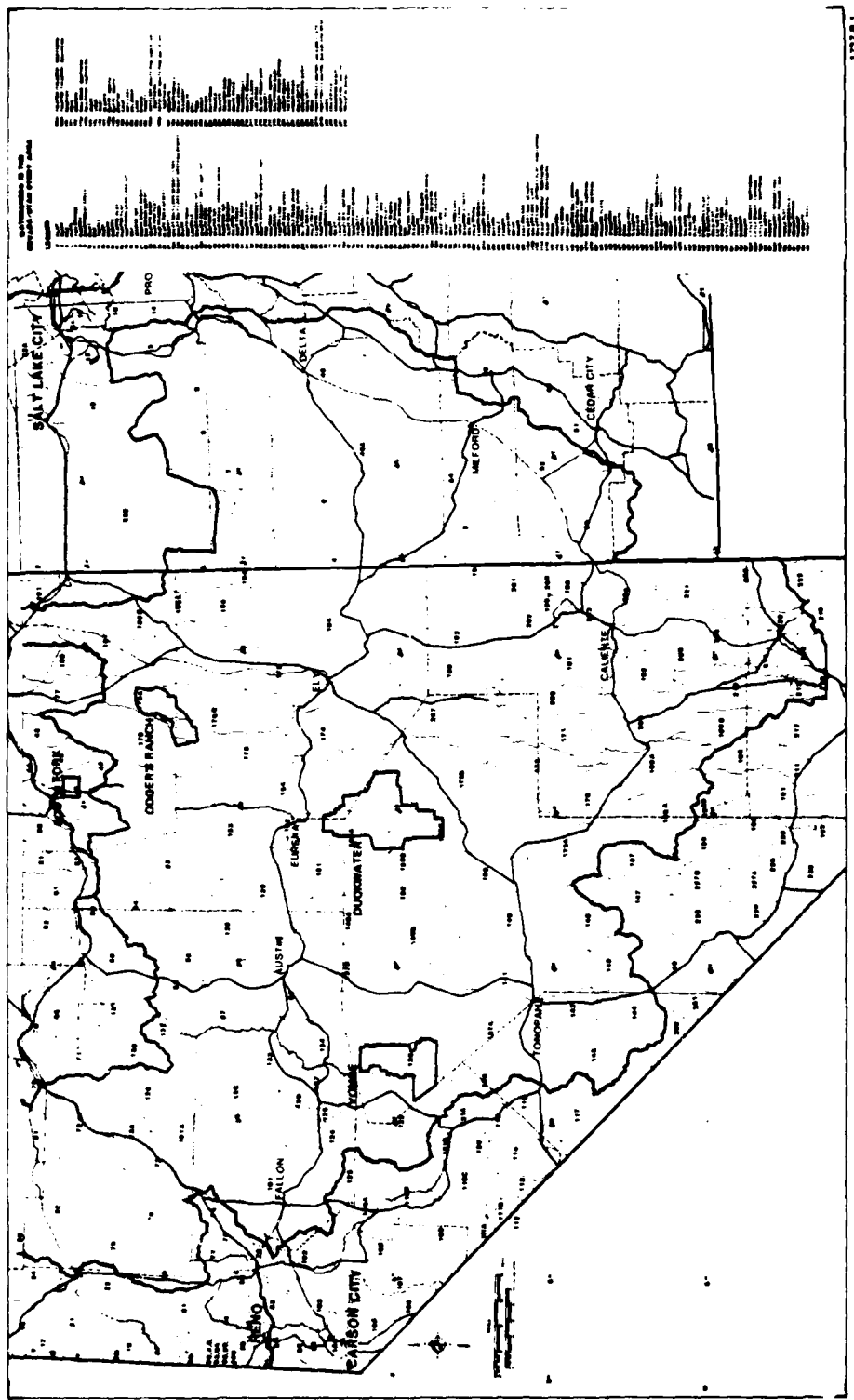


Figure 3.2-1. Duckwater, South Fork, Odger's Ranch, and Yomba BLM grazing allotments.

The Yomba reservation Indians in west-central Nevada held BLM grazing permits that total 268,397 acres. These permits include a 216,954 acre (88,782 ha) allotment in Lone Valley and two allotments totaling 51,443 acres in Upper Reese Valley (Figure 3.2-1). The Yomba reservation Indians also hold 94,800 acres of U.S. Forest Service permits, 59 percent of which is suitable for use.

In addition to the Native American reserve lands and grazing lands there are a number of cases in which the status of lands is equivocal, either undecided or in dispute. These are lands which have been proposed for withdrawal by Indian tribes or lands whose ownership is in dispute because of abrogated treaties. The study area also includes regions from which the federal government intends to withdraw land to restore reservations to the Utah Southern Paiutes. However, the lands to be withdrawn have not been specified. Each of these "reservation lands" issues will be discussed separately below.

Withdrawal lands. The Moapa Indians in southern Nevada proposed, in 1979, to withdraw 70,000 acres (28,000 ha) of land to increase their grazing and farming acreage. The acreage lies in four hydrological units: Garnet, California Wash, Muddy River Springs, and Meadow Wash. The application has been approved and awaits congressional action (Figure 3.2-2).

The Duckwater Shoshone propose to withdraw 352,000 acres (140,800 ha) or about 550 sq mi (1408 km²). (This figure is the most frequently quoted; however, the acreage is very poorly described and estimates vary of the total number of acres involved. One estimate places the total acreage at 800,000 acres and the Duckwater Shoshone have indicated that they will propose to withdraw all of it.) The proposed withdrawal area corresponds to the acreage for which BLM grazing permits are currently held by the Duckwater Indians and lies in the Little Smoky-north, central, and south and Railroad-North hydrological subunits. The application was filed in 1977. Action on the application is still pending.

The Yomba Reservation has filed a withdrawal application for approximately 20,000 acres (8,000 ha) in the Reese River Valley north of the present reservation.

Treaty lands. The Western Shoshone were given about 24 million acres of land in Nevada and Utah when the Ruby Valley treaty of 1863 was signed. The land tract was described as bounded on the north by the Wonggoga-da Mountains and Shoshone River valley; on the west by Smith Creek Mountains; on the south by Wi-co-beh and Colorado Desert and, in the east, by Steptoe Valley and the Great Salt Lake valley. This land was not "reserved" for the Shoshone and became increasingly populated by white settlers. In 1951, the Indians initiated legal proceedings demanding compensation for those lands to which they claimed title, but which had been appropriated in the 19th century. The Indian Claims Commission agreed with the Shoshone and awarded them \$26 million in compensation. The Te Moak Band of Western Shoshone refused payment in 1974, alleging that they, the Western Shoshone, still held title to the land and wanted land restoration, not monetary reimbursement. Their petition was denied in the lower courts and the Supreme Court refused to hear the case. Although some judicial channels have been exhausted, the Shoshone still claim title to their aboriginal territory. Claim to title has been used as a defense in a BLM trespass case. Litigation can be expected to continue.

The Moapa Southern Paiutes were given 3,900 sq mi (10,101 km²), or 2,496,000 acres of reservation land by executive order in 1873. These lands lie within the

Figure 3.2-2

Negative in D.C., overlay CA-0039-D, 3222-D basemap

southern tip of Nevada. In 1874, a new executive order, superseding the first one, was issued, adding 100,000 acres to the size of the land tract given to the Moapa Indians. However, in 1875, Congress ordered that the reservation be reduced to 1,000 acres. The Moapa Indians are engaged in a "major effort" to retrieve lands lost when the 1874 executive order was rescinded in 1875. Thus far, an application to withdraw 70,000 acres (28,000 ha), 4 percent of the original reservation, has been accepted.

The status of Southern Paiute Reservation lands in southern Utah is undetermined. In 1954, four bands of Southern Paiutes were terminated from federal trust status. A fifth band, the Cedar City band, was overlooked in the termination bill but was assumed by all concerned to also have been terminated. The five bands of Southern Paiutes who were either terminated or thought to be terminated are: Indian Peaks, Shivwitz, Koosharem, Kanosh, and Cedar City, many of whom subsequently lost their lands.

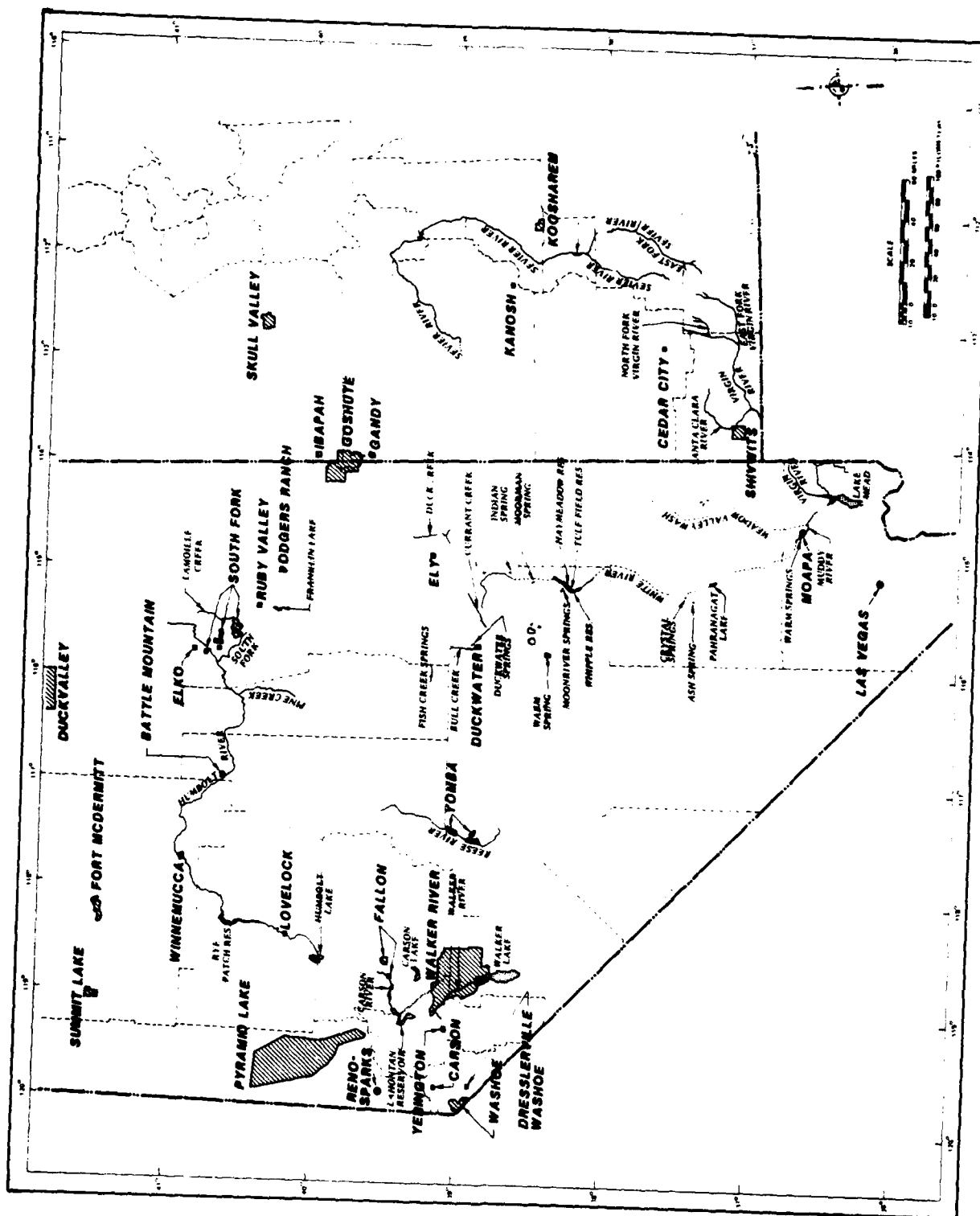
As of April 3, 1980, "The Federal trust relationship has been restored to the Shivwits, Kanosh, Koosharem, and Indian Peaks Bands of Paiute Indians of Utah and restored or confirmed with respect to the Cedar City Band of Paiute Indians of Utah" (Public Law 96-227:317). The law provides that reservation lands be restored to the extent possible and expanded. Inasmuch as the federal government has two years to develop its plan for the restoration and enlargement of these reservations, it is only possible to indicate (a) where the reservation lands were and (b) the Utah counties from which the federal government plans to withdraw lands for reservation restoration.

- (a) The Shivwits Reservation lies outside of the study area in southwestern Utah; Indian Peak is in Beaver County on the border of the Pine and Hamblin hydrological subunits (6 and 196, respectively). Koosharem Reservation straddles the county line of northeast Piute County and southeast Sevier County. Kanosh is in Millard County which is within the study area. The Cedar City band occupied lands owned by the Mormon Church when they were terminated, or thought to be terminated, and never had reservation land.
- (b) The Shivwits Reservation has been left largely intact but those of the other three bands that had reservation land have been partially or wholly appropriated by non-Indians. To provide these groups with reservation lands when the original lands cannot be recovered, and to provide lands for the Cedar City band, the "plan shall include acquisition of not to exceed a total of 15,000 acres (6,000 ha) of land to be selected from available public, state, or private lands within Beaver, Iron, Millard, Sevier, or Washington Counties, Utah" (Public Law 96-227:320).

Additional detail is given below on reserves of Native American groups having cultural ties or lands within the study area.

WATER (3.2.2)

Major river systems in the Nevada/Utah study area which are of concern to Native American populations are the Humboldt, Reese, Walker, Muddy, and Sevier rivers (see Figure 3.2-3). The Humboldt flows through or is adjacent to the



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Figure 3.2-3. Major river systems of concern to Native Americans in Nevada and western Utah.

Lovelock, Winnemucca, Battle Mountain, and Elko Indian Reserves. The South Fork of the Humboldt and its tributaries are principal sources of water for the South Fork and Ruby Valley reservations. The Reese River, which flows into the Humboldt in the Battle Mountain area, is the principal source of water for the Yomba Reservation through which it flows. The Muddy is an important water source for the Moapa Reservation and the Walker flows through the Walker Reservation. The Sevier river and its tributaries are important to the Southern Paiutes in Utah.

In addition to major rivers and tributaries, there are numerous springs of varying sizes in the study area which are economically significant for reservation and colony Native Americans, especially those with extensive grazing lands. There are also thousands of small streams and creeks flowing out of the mountain ranges. Because of the general aridity of the Great Basin, most are ephemeral, but creeks are an important water resource on some Native American reserves, nevertheless. Bull Creek and Fish Creek are primary sources of water for the Duckwater Shoshone; Spring Creek and Deep Creek are important to the Goshute Indians, and Hickman Creek is the principal water supply at the Skull Valley reservation.

Throughout most of the Great Basin, the stream and creek flows are erratic and/or minimal. Much of the surface water, therefore, is not diverted and utilized but seeps into the ground. As groundwater, the economic significance of the water is great. Wells are relied upon extensively by Indians and non-Indians for domestic, agricultural, industrial, and other purposes and groundwater storage volumes are of central concern to the area inhabitants.

The Muddy River, which flows south through the Moapa Indian Reservation, is at the downstream end of a topographic trough that includes, from north to south, White River Valley, Pahroc Valley, Pahrangat Valley, Coyote Spring Valley, and Moapa Valley. The White River channel, which flows through this trough, and groundwater from adjacent ranges, notably the Sheep Range to the west and the Delamar and Dry Lake valleys to the east, provide the groundwater recharge for Muddy River Springs (Eakin, 1963, 1964). Discharge from these springs is the source of the Muddy River (see Figure 3.2-4).

Because the Moapa Valley is arid, characterized by low precipitation, high temperature, and high evaporation rates, the groundwater recharge for the springs is highly important. The Muddy River Springs "are the base of the agricultural economy of the Moapa Valley" (Eakin, 1964: 12), and agriculture is the economic base of the Moapa reservation.

Water is considered to be of critical importance to reservation Indians in general and particularly to those living on reservations in arid regions. The BIA refers specifically to the "arid lands of the western United States" in its statement that the importance of water there "cannot be overemphasized" (BIA, 1978a; ii). However, serious difficulties arise over the question of which waters are Native American waters. This issue of Native American water rights is complex and inconsistent. Multiple and sometimes contradictory doctrines, which are applied differently in varying contexts and states, are involved. The most broadly applied doctrine is the federal water rights doctrine which was established in *Winters vs. U.S.* 207/U.S. 564 (1908) and reaffirmed in *Arizona vs. California* 373 U.S. 546 (1963). The doctrine holds that when an Indian reservation was created, . . . there was reserved or confirmed not only the land but also the right to enough water to

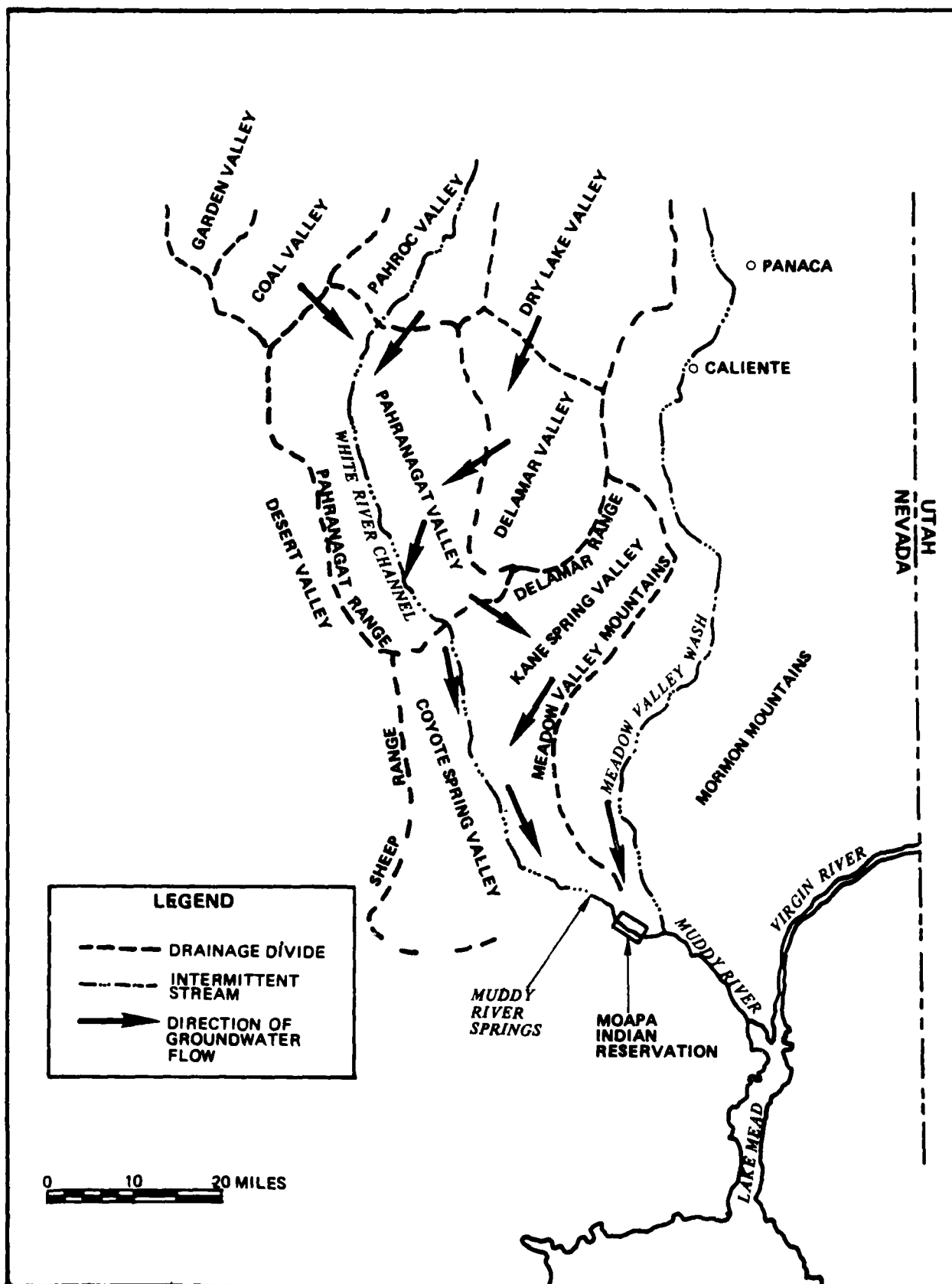


Figure 3.2-4. Groundwater recharge system for Muddy River Springs (adapted from Eakin, 1964).

irrigate the irrigable portions of the reserved lands or otherwise fulfill the purposes of the reservation" (BIA, 1978a:1). The Winters decision, and subsequent decisions, established the date of reservation formation as the date of water rights reservation, as well. Subsequent appropriation, therefore, by miners, farmers, ranchers, and others were superseded. This generated considerable controversy because the reservation Indians were being exempted from compliance with state laws stating that appropriated waters must be put to beneficial use. The federal reserved water rights doctrine overrides state law when it reserves for Native Americans the right to "enough water to fulfill the purposes of the reservation."

The federal doctrine is broad in scope and thereby leaves a number of issues open to question. What was the purpose for which a reservation was created? Are reserved waters limited to those required for irrigation or are they meant to include other purposes such as mining or recreational development, and how much water is "enough water?" There is also the question of state laws in Nevada and Utah which provide that first in time is first in right; the first user of the water has the right to it. "... any person can appropriate in perpetuity the right to use as much water as he can successfully divert and beneficially employ, as long as his appropriation is prior to that of others" (HDR 1980:8). To what extent can Native Americans claim rights to water which they were putting to beneficial use before water rights ever became a state and federal issue?

Finally, there is the question of groundwater rights. "Judicial or congressional determination of Indian rights to groundwater has not been made" (BIA, 1978a:2). However, in *Cappaert vs. U.S.* 426 U.S. (1976), the Supreme Court held that the federal government had a federally reserved right to groundwater. Specifically, the decision protected groundwater below Devil's Hole National Monument from being diminished by outside pumping, but the potential ramifications of the case extends to other federal lands. Reserved groundwater rights is the issue in a current case concerning Native Americans. In *United States and Papago Indian Tribe vs. City of Tucson* the Indians are trying to establish rights to reservation groundwater. The Santa Cruz River, which runs through the reservation, has been reduced to a dry channel by off-reservation pumping upstream. Should the courts decide in favor of the Tribe, the consequences would be far reaching since at issue is the establishment to groundwater rights for all Indian reservations (BIA, 1978a:3).

Because of these other problems surrounding the issue of Native American water rights, the exact nature, extent, and perpetuity of those rights remain controversial.

Several Native American groups in the area have resorted to litigation to protect their water resources. In 1963, the United States intervened on behalf of the Colorado River Indians in California and Arizona, citing the Winters decision to limit water diversions which would threaten the supply of reservations. The Arizona Papago are currently suing for rights to underflow and groundwater of the Santa Cruz River. Several lawsuits are pending which involve disputes over water rights to the Truckee and Carson rivers. The majority of these suits and counter-suits pit the Pyramid Lake Paiutes and Department of Interior against various water districts for improper and excessive diversions of Truckee-Carson waters. Diversions which exceed legal allocations have resulted in a significant drop in the water level of Pyramid Lake, raising the alkaline content of the lake and threatening tribal fisheries. The BIA has consistently supported the position of the Paiutes.

Shoshone-Paiute Indians at the Duck Valley Reservation in northern Nevada and southern Idaho have enlisted BIA support in their bid to acquire Whitehorse Reservoir at the headwaters of the Owyhee River. Their assertion that this valuable source of water is necessary for the economic development of the reservation has caused considerable controversy in the non-Indian community. In Utah, the Uintah and Ouray Reservation is currently utilizing its substantial water rights for political leverage; the tribe has recently cancelled contracts for deferral of some water rights to the Central Utah Project over the Utah legislature's failure to grant an extension of tribal hunting and fishing rights.

The cumulative effect of such aggressive and successful actions by Native Americans with respect to the procurement and protection of water rights is the promulgation of legal challenges by other Indian groups. Virtually all reservations in the study area with irrigable acreage have current plans for maximum development of farming enterprises and range improvements. Many reservations, such as Yomba, Duckwater, and Odger's Ranch, depend to a great extent on well water for farming and ranching activities. Any lowering of the existing water tables or groundwater supplies may dry up shallow wells, springs, and surface streams on which reservations depend. The BIA has traditionally supported the efforts of Indian reservations to protect or expand rights to water necessary for economic development. A study is currently being conducted by the BIA on present and proposed water use by Indian reservations.

EMPLOYMENT AND INCOME (3.2.3)

The inadequacy of reservation and colony land bases, in terms of both size and productive potential, has been a contributory factor in the low socioeconomic status of Indians in the study area. Per capita income averages well below \$1,500 annually, with no significant differences between rural and suburban reserves. Indians in rural areas derive limited incomes from ranching enterprises and seasonal employment, and often cultivate small gardens and hunt and gather to supplement their food supplies. Those living in colonies must rely upon jobs in nearby towns or cities. A combination of social and educational factors, however, contribute to a high rate of joblessness and low-income unskilled labor.

PUBLIC SERVICES (3.2.4)

Since the average family income for Native Americans in the study area is about \$5,000 annually, dependence on public assistance programs is high. The BIA administers several programs in the areas of public health, housing development, education, economic development, and technical assistance.

HUMAN ENVIRONMENT (3.2.5)

Native American reservations and colonies in the Great Basin are socially and/or physically isolated from communities of non-Indians. This isolation is both a cause and result of their cultural distinctiveness. Cultural persistence while not dependent on isolation is fostered by real or imagined barriers existing between people.

In the case of Native Americans in the Great Basin, there is the further fact of their local numerical superiority, except for urban and town colonies. this near

community numerical strength provides resistance to the forces of incorporation, at least in terms of numbers. The maintenance of cultural diversity is more difficult for individuals or families surrounded by others of dissimilar backgrounds. Opportunities for mutual cultural reinforcement are many where Native Americans make up a significant part of the local population.

Among Native Americans of the Great Basin ties of kinship, friendship, tribal, and minority identity act to connect otherwise isolated groups of people. These ties also promote migration among reservations and colonies. Native Americans in the Great Basin migrate freely to visit kin and friends, to attend religious and cultural events, and to take advantage of educational and employment opportunities. Much of this migration, as well as traditional migration for the same purposes and to exploit seasonal resources such as pine nuts, is directed toward locations where kin and friends already reside. Given the generally depressed economic condition of Native Americans in the Great Basin, migration in response to economic stimuli is high.

4.0 IMPACT ASSESSMENT

4.1 IMPACT METHODOLOGY

CULTURAL RESOURCES (4.1.1)

Impacts were assessed by comparing both known and predicted locations of Native American sensitive sites and areas with the proposed DDA and OB layouts. Over 300 such sites are known from the archaeological record, and may be precisely located. These, however, represent only a small fraction of the total Native American cultural resource base. Areas of predicted site densities were identified for deployment area valleys on the basis of historic and ethnographic accounts, and from information provided by local Native Americans. The data base is incomplete and allows only preliminary conclusions.

Known sites and predicted high sensitivity areas were mapped and overlayed at Beryl, Coyote Spring, Delta, Ely, and Milford. Two general criteria were applied in the impact assessment:

1. Proximity. The geographical relationship of culturally significant sites and resource zones to areas slated for project construction and operations is the most important criterion for impact assessment. Highest impact probability is projected for sites and resource zones which lie within a one-mile radius of proposed construction areas. Ideally, sites and resource zones outside this radius of disturbance will be less subject to impact in proportion to distance. The proximity index may be conceived as a series of radiating belts of varying distance from construction areas. All other factors being equal, the radius of direct and indirect impacts is expected to vary with the nature of project facilities. The impact radii drawn around construction camps and OBs are due to associated population influxes, considerably larger than the one-mile zone assumed for individual roadways, and other project components. Indirect impacts to Native American cultural resources are expected to extend considerable distances from new population centers. It is estimated these impacts will be most concentrated within 35 mi of construction camps and within 50 mi of OBs, and that these impacts will decrease proportionately with distance.

2. Accessibility. The accessibility criterion adds both spatial correlates and a time dimension to the assessment of impact probabilities. Geographical proximity must be qualified by a measure of the likelihood of areal penetration and damage by vandals and recreationists. Land terrain factors and the availability of access roads or corridors may reduce or increase the probability of site impacts predicted solely on the basis of proximity. For example, a habitation site in a relatively inaccessible region of a mountain range flanking a DDA valley may be less susceptible to indirect project impacts than a rock art site 50 mi from clusters in a lowland tank area of the same valley. In this case, new project roads and the flatness of valley floor terrain may in the short-term open wide areas to ORV traffic, whereas the rugged topography of more proximal mountain regions may discourage penetration over a comparable time interval.

Impacts to Native American cultural resources have two primary sources: ground disturbance associated with construction; and pilfering, vandalism, and ground disturbance (ORV traffic, erosion) associated with increased public access to

previously isolated areas. As noted above, it is assumed that direct impacts will occur to sensitive sites and areas which fall within one mile of construction activities. Indirect impacts during the construction and operations phases will be more intense due to the wider radius of potential disturbance to nonrenewable cultural resources. Studies in comparable environments, such as the adjacent California desert (Lyneis, Weide, and Warner, 1980), indicate that recent public use of the area for recreation has resulted in extremely high vandalism rates to rock art (80 percent), ancestral habitation sites (74-78 percent), ceremonial sites or structures (66 percent), and battlefields (65 percent). A comparable level of indirect disturbance is predicted for the majority of DDA valleys.

A third type of impact, which cannot be quantified, is the symbolic and spiritual effect on Native American traditional religions and cultural persistence. The M-X system will irreversibly alter the holy lands of Shoshone and Southern Paiute peoples. Since these sites and features are non-renewable, the destruction or defacement of cultural resources represents an irretrievable loss to the Native American and scientific communities.

The impact methodology utilized for Native American cultural resources may be briefly illustrated with two DDA valley examples. The first, Delamar Valley, is an example of high impact probability, and the second, Cactus Flat, an example of low impact probability. Due to the confidential nature of cultural resource locational data (which is mandated by law to enhance the protection of sites from vandalism), reference will be made here to only broadly defined sensitivity areas.

Delamar Valley was formerly occupied on a seasonal basis by Southern Paiutes, and is characterized by high site densities. Although only five sites associated with historic Indians have been plotted in the archaeological record, historic accounts and Southern Paiute oral testimony indicate that this region was a major stopping place on the annual migration routes of individual families and clans. The valley is known to contain extensive settlements and burials in both lowland and bajada zones, a Southern Paiute battleground, two rock art sites, and contemporary pine-nut gathering areas. All of these cultural resources are highly sensitive to members of the Moapa Reservation. The conceptual layout used for analysis would directly impact two known sites (1 or 2 studies may resolve these conflicts but the analysis is based on the conceptual layout). The valley area to be disturbed by construction activities, however, is expected to contain a large number of unrecorded settlement and burial sites. The potential for direct impacts to Southern Paiute cultural resources on the basis of proximity is therefore high. Indirect impacts to sensitive sites and areas are also predicted to be high due to: (1) the improved accessibility to the valley provided by the DTN and cluster roads, (2) the close proximity of resources to these roadways and to potential recreational attractions such as Delamar ghost town, and (3) the proximity of the valley to the Coyote Spring OB site, and its associated in-migrant population.

In contrast to Delamar Valley, Cactus Flat hydrologic subunit was only sparsely occupied in late prehistoric and early historic times. Three known Shoshone campsites are located in the adjacent Kawich Range, where water was more plentiful. Oral testimony collected from Shoshone elders earlier in the century indicates that the valley floor region was utilized primarily for seasonal rabbit and antelope drives. No sites are recorded for the area of Cactus Flat hydrologic subunit to be directly impacted by the proposed cluster road and missile

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shelters. Although Shoshone campsites may occur in this region, site densities are expected to be low and the total disturbance area is limited. Indirect impacts attributable to the Proposed Action are also predicted to be low for two primary reasons: (1) the cluster road does not significantly enhance accessibility to known and probable high sensitivity areas, such as the Kawich Range and (2) the Cactus Flat area is not proximal to proposed OB sites or other project facilities associated with population in-migration.

SOCIOECONOMIC RESOURCES (4.1.2)

Potential impacts of M-X deployment on Native American physical and human resources are judged on the basis of worst case scenarios with an overriding criteria of the maintenance of the distinctiveness and viability of Native American culture and society. Unlike other categories of resources Native Americans are people and thus impacts are not fully predictable. They are, however, relatively well defined groups of people with more or less well defined finite land and water resources.

In projecting potential impacts, and in suggesting potential mitigations, Native American physical resources such as land and water were compared to potential M-X requirements. Over the course of the environmental review process land resources potentially impacted by deployment were gradually excluded from the design leaving, at present, no Native American land resources directly impacted. Indirect impacts on future and claimed lands were assessed using the criterion of the expressed concern for these potential resources by Native Americans and their overlap with the Proposed Action or any of the possible alternative actions. Native American water resources were judged potentially impacted on the basis of competition with M-X construction or operation demands. Again, a worst case scenario was constructed to generate suggestions for mitigative methods to avoid those impacts.

Potential project impacts on Native American human resources are more problematic. There are no precise data nor models with which to project these impacts on cultural persistence and socioeconomic wellbeing. Impacts were judged based upon knowledge of: trends apparent among Native Americans living in the Great Basin, their concerns, and the scope of the project. These are qualitative judgments. Built into them is an element of the "worst case" but on the whole they are attempts to project future trends in the absence of hard data. Suggested mitigations for possible impacts on Native American human resources are based upon the need to alter the basis for impacts where possible (economic aid, job opportunities) and to monitor actual impacts during and after construction so as to provide for ongoing mitigations based upon reality.

4.2 IMPACTS ON NATIVE AMERICAN RESOURCES

CULTURAL RESOURCES (4.2.1)

Ancestral/Sacred Sites (4.2.1.1)

Native American ancestral/sacred sites are protected by a number of federal laws, including the National Environmental Policy Act and Council on Environmental Quality regulations (40 CFR 1500-1508); the National Historic Preservation Act, Executive Order 11593, and 36 CFR 800-Protection and Historic and Cultural

Properties; and the American Indian Religious Freedom Act (Public Law 95341). These laws are discussed in Section 1.1. Since the Proposed Action and project alternatives pose disparate impact potentials to these cultural resources, a separate discussion will be devoted to each option.

Proposed Action

The DDA contains 313 known Native American ancestral/sacred sites, 39 of which are within 1 mi of the representative protective shelters, cluster roads and DTN used in this analysis. In addition to specific sites, there are general areas within the DDA valleys known to be associated with late prehistoric and historic Indian settlements (see Figure 3.1-1). DDA valleys are ranked according to predicted resource abundance and impact potential in Table 4.4.1-1 below.

The Coyote Spring Operating Base lies on a major seasonal migration route of ancestral Southern Paiutes and is associated with both temporary and permanent habitation sites, burials, and a wide variety of other sacred features. Although precise site locational data are scant, several general areas in and adjacent to the OB siting area are known to have been occupied by the ancestors of contemporary peoples. These include Coyote Spring, foothill areas adjacent to the White River from Coyote Spring north to Alamo in Pahrangat Valley, Kane Springs Wash; the Sheep Range, all ephemeral streams and washes in Coyote Spring Valley which feed Muddy Springs, Muddy Springs proper, the entire length of the Muddy River, and Meadow Valley Wash. Site densities are expected to be high throughout the OB siting area with a high potential for direct impacts to ancestral settlements and associated burials during the construction phase.

Areas adjacent to the OB facilities will be opened up to more extensive public use during the operations phase. Indirect impacts, such as pilfering and vandalism, to ancestral/sacred sites will likely result from the substantial population immigration associated with the base (see Table 4.4.1-2 below). Arrow Canyon, for example, which lies just southeast of the OB site, is regarded as sacred by contemporary Southern Paiutes. This holy place contains spiritual areas and important rock art sites, many of which have already been disturbed by vandals. Other significant Southern Paiute cultural resource sites, such as burials, surface settlements, and storage caves, which currently enjoy a high degree of integrity, are similarly imperiled by base development. At present, there are no known effective measures to prevent the recreational intrusion of surrounding pristine areas. Finally, contemporary Southern Paiutes continue to utilize the public lands in question for traditional activities, including the gathering of sacred plants. Any depletion of the water table associated with construction needs may reduce flow to springs and marshes on which such species depend, thereby limiting Native American access to sacred plants.

Potential mitigation measures should be developed in association with the Moapa Reservation tribal government. In comparable Air Force projects mitigation increases have included, onsite inspection of proposed disturbance areas by designated tribal members to identify sites and features which have cultural and sacred significance to local Southern Paiutes and where avoidance of such sites is not possible, data recovery programs. Representatives of the Moapa Reservation consider return of artifacts to the Reservation and possible financial assistance for their curation and display at a tribal museum to be important measures which will

contribute to the retention of a cultural identity and a heritage for succeeding generations.

The northern Escalante Desert was part of the ancestral territory of the Kwiumpits band of Southern Paiutes, whose farming settlements were concentrated along the Beaver River. Direct impacts to significant resources may occur as a result of support community construction in the vicinity of Milford, although disturbance in this area is already considerable due to irrigation farming. Direct impacts to campsites associated with seasonal food gathering and antelope drives are probable along ephemeral streams which flow from the Wah Wah Range and southern tip of the San Francisco Mountains into the OB siting area. Site data, however, are too incomplete to accurately predict the intensity of direct impacts at this time. Projections on the radius of indirect impacts appear in Table 4.4.1-3.

A potential mitigation measure would be the inclusion of representatives from the Kanosh and Cedar City bands of Utah Southern Paiutes in preconstruction surveys of proposed disturbance areas to determine if culturally significant sites are present.

Alternative 1

Predicted impacts to significant Native American cultural resources in the DDA and in the area of the Coyote Spring OB are identical to those indicated for the Proposed Action.

No ancestral/sacred sites are recorded for the southern Escalante Desert region between Lund and Modena is subject to direct construction impacts. Historic data indicate this region was formerly exploited on a seasonal basis by Southern Paiute peoples for food gathering and for rabbit and antelope drives. Aboriginal campsites, if present, are most likely to occur along ephemeral streams which emanate from surrounding mountain areas.

As a rule, upper bajada and mountain areas hold the greatest potential for ancestral/sacred sites. Sites associated with Southern Paiutes are known in the Dixie National Forest, and for canyon and mountain areas between Modena and Hamblin Valley. The southern Needle and Wah Wah ranges comprised the former population center of the Indian Peaks band of Southern Paiutes, and dense site concentrations are likely throughout this mountain region. The anticipated increased recreational use of mountain areas adjacent to OB facilities during the construction and operations phases poses a substantial threat to the integrity of these resources, the majority of which are presently unrecorded (see Table 4.4.1-4).

Potential mitigation measures include preconstruction surveys of proposed disturbance areas within the suitability zone that include the participation of representatives from federal and state agencies, the Cedar City, Indian Peaks, and Shivwits bands of Southern Paiutes and coordination of suitable mitigation measures with the respective governments of these bands.

Alternative 2

The Delta OB suitability zone falls within one of the most densely settled aboriginal areas in the Utah siting area. The Sevier and Beaver rivers supported

permanent fishing villages associated with the Western Ute in prehistoric and historic times. Areas adjacent to these rivers were utilized for gathering and hunting activities on a seasonal basis, and are expected to contain numerous campsites. Although site density is predicted to be high within the Delta suitability zone, Native American cultural resources in this area remain undocumented. Known sites are limited to several lithic scatters and campsites which lie east of Highway 50 in close proximity to the railroad spur linking the OB to the Union Pacific line. Site densities in the suitability zone are expected to be greatest within a 2-mi radius of the Sevier and Beaver Rivers. Tier 2 surveys are anticipated to identify many Native American ancestral/sacred sites (see Section 1.7 of the DEIS).

The larger northern Sevier Desert area contains a wide variety of significant Native American cultural resources which are subject to indirect impacts associated with population in-migration (see Table 4.4.1-5). Historic Ute villages are documented for Deseret and nearby Lynndyl, Holden, Kanosh, Scipio, and Black Rock. Additional settlements are known for the Sevier Lake region just south of the OB area. Important rock art sites also fall within the radius of potential indirect impacts. Four petroglyph sites are located in the lava flows just south of Delta, and additional sites occur to the north in the Simpson and Sheeprock mountains. Southern Paiute Indians residing at Kanosh and Richfield have expressed concern to the U.S. Forest Service for burials located in the Pahvant Mountains west of the OB siting area. The population influx associated with base development, along with the simultaneous development of the Intermountain Power Project at nearby Lynndyl, may lead to even greater demands on the Forest Service for increased recreational development of wilderness or roadless areas in which sensitive Native American resources are concentrated.

Mitigative measures appropriate to the Delta OB include extensive preconstruction survey of proposed disturbance areas, and consultation with local Southern Paiutes at the Kanosh Reservation.

Alternative 3

Predicted impacts to significant Native American cultural resources in the DDA are identical to those indicated for the Proposed Action.

The Beryl OB discussion in Alternative 1 is also relevant to Alternative 3, with the following addendum. As a primary base, the Beryl site will involve additional ground disturbance in lowland regions for construction of the DAA and OBTS, thereby increasing the likelihood of direct impacts to ancestral habitation sites. Highest disturbance potential, however, is associated with construction of the DTN which links the DAA and OBTS with missile clusters in Pine Valley. The DTN will proceed through pristine areas of a major mountain pass known to be associated with dense aboriginal settlements. Similarly, the DTN route flanks the eastern foothills of the Needle Range in Pine Valley, which includes the former population center of the Indian Peaks band of Southern Paiutes. This area has high sensitivity for contemporary peoples and is associated with significant resources of both a secular and sacred nature which continue to be used in the traditional manner. Three suitability zones are associated with the Ely OB (two immediately north of the city of Ely in central Steptoe Valley, and one south of Ely in the southern portion of the valley). Suitability zones north of Ely are known to have been densely settled by Shoshones in prehistoric and historic times. Large winter settlements were located

near Ely, Grass Springs, and Warm Springs. Numerous campsites associated with seasonal subsistence pursuits are likely to occur throughout the valley floor and surrounding foothill areas. The suitability zone just north of Ely also contains a traditional ceremonial site, which is still used by contemporary Shoshones. Areas north of Ely are expected to be very sensitive to local Native Americans.

For the Ely OB suitability zone south of Ely, the greatest potential for adverse impacts to Shoshone cultural resources lies in the lower and upper bajadas of the Egan Range. This area contains abundant springs and traditional foods (pine-nuts, game), and is likely to be associated with ancestral settlements, burial grounds, and other sacred features. Lowland regions of the suitability zone are expected to be less sensitive, comparatively. The valley floor, however, contains the confluence of several ephemeral mountain streams, including the larger Willow Creek Drainage. Seasonal Shoshone campsites associated with gathering activities and rabbit-drives have a high probability of occurrence in this area.

Due to the dense Shoshone settlement of Steptoe Valley and adjacent Spring Valley in prehistoric and historic times, the indirect impacts to ancestral/sacred sites which typically accompany substantial population in-migration may be extensive in the long-term (see Table 4.4.1-6). A preconstruction survey of all potential disturbance areas, involving the active participation of Shoshones from Ely Colony, would be expected to identify specific sites which are culturally significant to contemporary peoples.

Alternative 4

Predicted impacts to significant Native American cultural resources in the DDA and in the area of the Beryl OB are identical to those indicated in the Proposed Action and in Alternative 3, respectively.

The discussion of the Coyote Spring OB area in the Proposed Action is also relevant to Alternative 4, with the following difference. Of all the OB alternatives, Coyote Spring has the greatest impact potential to known Native American cultural resources. Utilization of the Coyote Spring site for a secondary base, and hence the elimination of the DAA and OBTS, will substantially reduce the magnitude of direct impacts to ancestral/sacred sites, particularly in the areas of Pahrnagat Wash, Kane Springs Wash, and the Lower Pahrnagat Valley. No significant change is seen, however, in the level of indirect impacts.

Alternative 5

Predicted impacts to significant Native American cultural resources in the DDA and in the area of the Ely OB are identical to those indicated for the Proposed Action and for Alternative 3, respectively.

The discussion of the Milford OB area in the Proposed Action is also relevant to Alternative 5, with the following addendum. Utilization of the Milford siting area for a primary OB will result in a significant increase in ground disturbance for construction of the DAA and associated railroad spur, OBTS, and the DTN which links these two facilities to missile clusters in the Wah Wah Valley. No site-specific data on significant Native American cultural resources are available for these areas of potential direct impacts. The probability of Southern Paiute campsites in the

southwestern portion of the suitability zone is moderate to high, particularly in the area of ephemeral streams which emanate from the White Mountain area. In addition, proposed placement of the OBTS facility penetrates forested zones, where aboriginal settlements and burials are more likely. Tier 2 environmental survey will increase the available information for impact assessment.

Alternative 6

Predicted impacts to significant Native American cultural resources in the DDA are identical to those indicated for the Proposed Action.

Alternative 6 combines the primary base site at Milford with the secondary base site at Coyote Spring. Discussions relevant to the Milford OB are the same as the Proposed Action and Alternative 5. For potential impacts relevant to Coyote Spring, see the Proposed Action and Alternative 4.

Alternative 7

From the perspective of significant Native American cultural resources, Alternative 7 appears to have the least potential for negative impacts on the material heritage and traditional lifeways of contemporary Indian peoples. No direct impacts to known aboriginal habitation or sacred sites are indicated in the DDA or suitability zones of the Clovis and Dalhart OB sites. The paucity of known sites attributable to the ancestors of modern Apache, Kiowa, Kiowa Apache, and Comanche peoples is due, in part, to historical factors. The introduction of the horse in the 17th century by Spaniards precipitated the development of highly mobile Indian societies. Although equestrianism permitted the evolution of individual bands into large communities, the frequent movement necessitated by hunting and warfare favored the development of highly portable dwellings and other utilitarian artifacts. This settlement pattern greatly reduced the material evidence of former habitation. Moreover, due to the similarity of artifacts utilized by deployment area tribal groups, and frequent trade among them, the ethnic affiliation of known sites cannot be identified with any certainty.

The relative cultural significance attached to potential resources in the Texas/New Mexico area by contemporary Indians is also unknown. Apache, Kiowa, Kiowa Apache, and Comanche peoples native to lands in the DDA have been established on reservations in Oklahoma and central New Mexico for over a century. Thus the geographical and cultural continuity with ancestral lands and sacred features which characterizes Nevada/Utah Indian tribes is less pronounced.

Historic land use is a third factor relevant to the intensity of cultural resource impacts. Whereas the major portion of the Nevada/Utah DDA is disturbed only by grazing, the Texas/New Mexico DDA has been intensively utilized for agricultural and ranching purposes for the past century. This division of land areas into private holdings restricted the continuation of Indian usage and accelerated the disturbance of existing Native American cultural resources through development. The cumulative effect of Indian removal and non-Indian land appropriation has been a comparative reduction in the overall cultural significance assigned by contemporary Native Americans to resources in the Texas/New Mexico DDA.

Alternative 8

There are no known impacts to significant Native American cultural resources in the Texas/New Mexico DDA. For further discussion, see Alternative 7 and ETR-22.

The Nevada/Utah half of the Alternative 8 DDA includes 24 of the 37 valleys included in the Proposed Action. These valleys contain 212 known ancestral/sacred sites, 17 of which are within 1 mi of the representative placement of protective shelters, cluster roads, and the DTN. The Alternative 8 DDA valleys are ranked according to predicted resource abundance and short- and long-term impact potentials in Table 4.4.1-7.

The impacts of Alternative 8 on known Native American cultural resources are considerably less than those projected for the Proposed Action. The difference stems from the reduction of deployment area valleys in Nevada/Utah from 37 to 24, and the corresponding substitution of Texas/New Mexico lands where cultural resources are less densely distributed, and where historical factors have contributed to a decrease in Native American sensitivity regarding these resources. Due to the strong cultural ties maintained by Shoshone and Southern Paiute Indians, any reduction in the land area utilized for deployment in Nevada/Utah will have a positive effect by reducing cultural resource impacts. A common feature of all Nevada/Utah alternatives is the unequal burden placed on specific tribal groups with respect to the potential loss of material and spiritual resources central to cultural persistence. An assessment of project effects must take into consideration not only impacts to specific sites of concern to Native Americans, but the cumulative effects of significant resource loss on the survival of traditional cultural systems.

The Coyote Spring OB in Alternative 8, as noted in the discussion of the Proposed Action, has the greatest potential of all base options for negative impacts on ancestral/sacred sites and features. The Clovis OB is discussed in Alternative 7.

Hunting and Gathering Areas (4.2.1.2)

There are many regions within the DDA which continue to be exploited by contemporary peoples for traditional foods, medicines, and craft materials (see Sections 2.2.3 and 3.1). These resources, while important in varying degrees for the maintenance of cultural institutions, do not fall under the direct protection of present cultural resource environmental laws or the American Indian Religious Freedom Act. Data on contemporary Native American gathering and hunting areas are poor. The assessment of potential impacts to this category of resources is therefore, necessarily preliminary in nature.

Hunting Areas

Large game and sage grouse hunting areas currently known to be exploited by Native American are located in higher elevation regions of the DDA hydrologic subunits, which are geotechnically unsuitable for M-X deployment. No direct impacts, therefore, are anticipated. The habitats of smaller game animals which may be of importance to contemporary Indians, however, such as rabbits or chuckwallas, may be adversely affected by deployment. These impacts are not expected to be large or significant.

Food Gathering Areas

A wide variety of native food plants continue to be gathered on a seasonal basis throughout the deployment area. These foods provide an important dietary supplement for Native Americans.

Pinyon groves are encountered throughout the two-state region at altitudes ranging from 5,000 ft in the north to 7,000 ft in the south. Native Americans gather pine nuts as a food resource and as a marketable commodity. Numerous pinyon groves are exploited, but groves produce variable annual yields. Harvesters therefore will travel far to exploit those groves producing highest yields. However, while pinyon-juniper groves would generally be avoided, some extension into the pinyon-juniper groves may be required and this would necessitate the selective removal of pinyon trees.

In addition to pine-nuts, seasonal harvesting activities include numerous other species, such as native grass seed plants, vegetable plants, herbs, and root plants. These resources may occur in geotechnically suitable areas. Direct impacts to native plants may result from ground disturbance associated with construction. Such disturbed areas are typically invaded by the noxious weed Halogeton, with which native species cannot successfully compete. Indirect impacts to native plant habitats may also result from the increased recreational use of natural areas which is expected to accompany population in-migration associated with M-X.

Traditional Pharmaceuticals

Environmental resources utilized by contemporary Indians for medicinal purposes include native plants, and special clays and other inorganic materials. Several plants are manufactured into teas and other preparations for the treatment of physical ailments. White clays and certain stone materials also have curative functions for some Native American groups in the deployment area. With respect to traditional pharmaceuticals, there is considerable potential for overlap between the secular and sacred domains. That is, some of these resources may be properly regarded as sacred materials, and therefore qualify for protection under the American Indian Religious Freedom Act. There is a potential for direct and indirect impacts to medicinal plants, and to special clay and stone deposits during the construction and operations phases. Further data needed to assess these effects would be collected as part of Tier 2 studies.

Traditional Craft Materials

Traditional crafts, such as finely made baskets and cradleboards, are persistent among specialists on Shoshone and Southern Paiute reservations in the deployment area. Willows, tule, devil's claw, and other riparian species necessary for the production of these items are subject to project impacts. Primary disturbance factors are ground disturbance and potential water depletion. Additional data on the location of these resources are needed in order to assess potential impacts associated with M-X deployment.

PHYSICAL RESOURCES (4.2.2)

Reservation Lands

Native American reservation and colony lands are excluded from M-X deployment. Therefore, there will be no direct impacts on Native American reservation and colony land resources under the proposed action or any of the alternatives. Indirect impacts, attributable to project-induced population influx, increased public access, and the resulting acceleration of recreational activity, are probable. An increase in trespassing (especially with ORVs), poaching, and illegal fishing is expected on reservation lands made accessible by nearby DTNs and cluster roads. The Goshute Reservation on the Nevada/Utah border would be near such facilities under the Proposed Action and alternatives 1-6, but not under the split basing Alternative 8. The Duckwater Reservation, except as buffered by proposed reservation expansion areas, are surrounded by DTNs and cluster roads and thus accessibility would increase. Some level of increased trespass would occur but the level is expected to be minimin. Under split deployment, however, the potential for trespass and poaching is reduced, as new access roads would only approach the reservation from the south. The Yomba Reservation, to the west of the Nevada/Utah DDA, already experiences high traffic levels in the summer from tourists visiting the nearby Berlin Ichtyosaur State Park. This traffic is expected to increase. Under the full deployment DDA, DTNs and cluster roads would provide greater access to this tourist object and the reservation from the south. Under split deployment--Alternative 8--DTNs and cluster roads would be sufficiently distant from the Yomba Reservation that no increase in tourist traffic to the park is expected.

Grazing Lands

There are three large tracts of land for which Native Americans hold BLM grazing permits in or adjacent to the Nevada/Utah full deployment DDA. These are: the Duckwater Shoshone grazing lands in Little Smoky-North, central and south (155) and Railroad-North (173A) hydrologic subunits; the Te Moak Shoshone/Odger's Ranch allotment in the Butte-North and South (178), Long (175), and Ruby (176) hydrologic subunits; and the Yomba allotment in Ione (135) and Upper Reese (56) hydrologic subunits (Figure 3.2-1). In each case these grazing lands are situated in valleys considered to be geotechnically suitable, but they have been avoided on purpose. The Duckwater allotments, however, are in the middle of the Nevada/Utah full deployment DDA and on the northern edge of the Nevada/Utah split deployment DDA.

M-X land withdrawals in areas adjacent to current holdings could impose constraints on future land additions and future herd increases. The expansion of their economic base is perceived by Native Americans in the region as absolutely essential.

An additional potential indirect impact on Native American BLM permit grazing lands is the possibility of their being opened for other uses including settlement under the Desert Lands Entry Act. Increased public access attributable to DTN and cluster roads could result in public pressure for alternative uses. All Native American BLM permit grazing lands are under this potential threat. The Te Moak Shoshone South Fork Reservation has already been told that their grazing

lands are open for alternative uses, including settlement (Facilitators, 1980). Under the Nevada/Utah split deployment DDA - Alternative 8 - this possibility is rendered less likely as DTNs and cluster roads do not approach Native American grazing lands to the same degree as under full deployment. The only exception is the Duckwater Reservation allotments, which however, are partially protected by their application for the addition to their reservation of their BLM grazing allotments.

Withdrawal Lands

Native Americans in the Great Basin perceive the expansion and control of their economic base. The Moapa Reservation is an example in this regard, for it actively seeks economic independence and self-sufficiency. The addition of lands to land-poor reservations is their most useful and obvious method for expanding their economic base and gaining control over the land resource--control that can lead to Indian-directed economic development. Expansion of reservation resources is also felt necessary simply to keep up with the economic needs of an expanding population and to meet the expectations of an increasingly sophisticated membership.

The Duckwater Reservation proposes to withdraw 352,000 acres to expand their reservation holdings. This is the same land for which they currently hold grazing permits. A considerable portion of this land is geotechnically suitable for project deployment, but has been avoided as a policy exclusion by the Air Force (see ETR-1). The 352,000 acre proposal is based upon a description provided to the Duckwater by the BLM, one description among three received. The BIA and the Duckwater Reservation, however, believe that at one time the Reservation held grazing allotments amounting to 800,000 acres. They are currently attempting to document this figure. If they do, their proposed reservation expansion will be amended to include the full 800,000 acres. This land, if documented, would be in direct conflict with the conceptual layout, especially in Hot Creek Valley (156) and in other areas adjacent to the current BLM grazing permit areas (Figure 3.2-2). Future developments will be monitored and a resolution developed if this becomes an issue.

The Moapa Reservation is awaiting final congressional action on a proposed 70,000 acre expansion (Figure 3.2-2). This expansion would not be directly impacted by the Nevada/Utah DDA in either its full deployment or split deployment modes. Lying to the south and west of the existing reservation, this land is adjacent to Coyote Spring, a possible OB site. The effects of that base site on the Moapa Reservation is discussed in Section 4.2.4.2.

The Kanosh, Cedar City, Shivwits, Indian Peaks, and Koosharem/Richfield bands of Utah Southern Paiutes have recently been reinstated to federal trusteeship. The federal government intends to withdraw up to 15,000 acres to provide reservations for these bands, with the exception of Shivwits band where tribally owned lands will be returned to federal trusteeship. This acreage will be withdrawn from federal, state, and private lands in Beaver, Iron, Millard, Sevier and/or Washington counties and could include former reservation land. There may be a conflict between M-X land requirements and withdrawal of reservation lands, under either full or split deployment. The 9,000 acre former Indian Peak Reservation, on the border of Pine and Wah Wah valleys, is just to the south of the Nevada/Utah full and split deployment DDA. This former reservation has a high probability of being returned to the Indian Peaks band. It was purchased in its entirety by the state of

Utah Fish and Game Management Area. No direct impact on these lands is expected. Indeed, the construction of cluster roads would be a valuable resource to the Indian Peaks Band if they regain their reservation. These same cluster roads could, however, generate indirect impacts through increased public access.

Treaty Lands

The Native American inhabitants of the Great Basin lost control over much of their lands through takeover by settlers and through treaties with the United States government.

The Te Moak Shoshone claim title to 24 million acres of land in Nevada on the basis of the 1863 Ruby Valley Treaty (see Figure 2.4-5, the treaty lands correspond generally to the Shoshone occupation lands in Nevada). The claimed land includes much of the land in Nevada that is geotechnically suitable for M-X deployment. A petition for land restoration has been denied by the courts. Other legal channels are being pursued. The Shoshone title to much of the land under consideration for M-X deployment has never been extinguished. For the Te Moak, deployment on these ancestral lands would further cloud the clear title they have been pursuing and limit the use of land they claim is legally and morally theirs. Under split deployment less of these treaty lands would be impacted.

Water

Native Americans in the Great Basin are extremely concerned about the integrity of their present and potential water resources. In the arid lands of Nevada/Utah water is the key to economic survival and for Native Americans the key to cultural persistence.

M-X deployment in the Nevada/Utah area requires large quantities of water for construction and for operation. Potential impacts to Native American water resources follow from these requirements in an arid region.

These impacts could occur in the Railroad (173 A&B) and Little Smoky (155 B&C) valleys surrounding the Duckwater Reservation and its BLM permit grazing lands. Impacts could also be felt at the Moapa Reservation which is dependent on water from Muddy River Springs and the valleys belonging to the White River drainage system. These are: Coyote Spring (210), Kane Springs Valley (206), Dry Lake Valley (181), Delamar Valley (182), Pahrangat Valley (209), Pahroc Valley (208), Coal Valley (171), Garden Valley (172), White River Valley (207), Cave Valley (180), Jakes Valley (174), and Long Valley (175) (Eakins, 1966). The water resources in the Goshute Reservation (on the northern edge of the Nevada/Utah DDA in the hydrologic units) primarily Spring Creek and Deep Creek, are at little, if any, risk of impact. The Te Moak Shoshone water resources at Odger's Ranch (in the hydrologic subunit) also lie north of the Nevada/Utah DDA and no impacts are expected. The primary Yomba Reservation water resource, the Reese River (in the hydrologic subunit), and the water resources on its BLM permit grazing lands are to the west of the Nevada/Utah DDA and no potential impacts are foreseeable. The old Indian Peaks Reservation, which might be restored to the Indian Peaks Band of Utah Southern Paiutes, is on the southern edge of the Nevada/Utah DDA (on the boundary between the Wah Wah and Hamblin hydrologic subunits). Potential conflicts over water resources in this region are not known.

M-X construction requirements in the valleys surrounding the Duckwater Reservation will total 12,600 acre-ft, 8,400 in Railroad Valley (173) alone. It is unlikely that these Duckwater area requirements would have any meaningful effect on valley and regional water resources, but short-term localized effects on Duckwater Reservation irrigation and stock-watering springs and wells could occur. If M-X construction water extraction were to occur sufficiently close to existing wells and springs to lower the water table (diminishing supplies and lowering the productivity of irrigated land and that of cattle herds, especially if pumping were to coincide with a cycle of climatically dry years), this impact could be very significant.

Under split deployment the potential impact to Duckwater Reservation water resources is significantly reduced and limited to a small potential in Little Smoky-South Valley (155 C).

Recovery would follow a few weeks or months after such pumping ceased, as water table levels returned to normal. Longer term damage would occur if a temporary localized drawdown of the water table disrupted the underlying structure of springs and shallow wells such that recovery is impaired. Analysis will depend on more specific well placement and utilization levels and appropriate model analysis to be conducted during Tier 2 studies. These possible impacts on the Duckwater Reservation are avoidable if care is taken to locate M-X construction wells sufficiently distant from Duckwater water sources so as to avoid any impact due to excessive drawdown.

Construction demands in the White River drainage will be spread over several construction groups, and it is anticipated that little effect would be felt at the discharge of Muddy River Springs unless construction coincides with a series of years of less than normal precipitation. Discharge at Muddy River Springs, and the perennial yield of the lower White River drainage (Coyote Spring, Kane Springs, Muddy River Springs), is a relatively constant 36,000 acre-ft/year. Removal of groundwater within the White River drainage (without natural recharge) would ultimately be felt at the Muddy River Springs. Reduction in flow at Muddy River Springs would hinder agriculture at the Moapa Reservation (water usage there is 6.8 times state decrees) and reduce their plans to develop a 70,000 acre proposed reservation expansion. The Moapa Reservation presently diverts 12 cfs from the Muddy River, fully 24 percent of the discharge of the Muddy River Springs, and 26 percent of the streamflow of the Muddy River at Moapa.

The unsolved issue of Native American water rights in the western United States makes an assessment of the potential effects of M-X deployment on Native American water resources difficult. Certain issues, such as on-reservation water resources, are relatively clearcut. Controversies surrounding water on adjacent land, groundwater pumping, nonagricultural development needs and other difficulties, however, continue (Section 3.2).

THE HUMAN ENVIRONMENT (4.2.3)

Native Americans in the Great Basin are generally economically depressed, and geographically as well as socially isolated from non-Indians. M-X deployment in Nevada/Utah will therefore have far reaching effects on the lives of Native Americans.

During aboriginal times Native Americans migrated throughout the region to attend religious events and to take advantage of dispersed or seasonal resources such as fish and pine-nuts. A tradition of intraregional migration has continued to the present. This tradition has been further augmented in recent times by migration to take advantage of educational and job opportunities, to live with distant kin, and to be near the venues of social and cultural events.

Significant changes in migration rates and patterns, with corresponding impacts on Native American resources and lifeways, would result from the development of new economic foci in the region. Native Americans experience chronic unemployment and underemployment. Kin relations, the tradition of mobility, and economic reality combine to cause migration toward new economic foci. Because of limited infrastructure and resources, migration may overwhelm the economic and socio-cultural resources of nearby Native American reservations and colonies. Conversely, migration may also cause an economic, social, and cultural decline at reservations and colonies distant from those centers of economic activity.

There are a number of Native American reservations and colonies in and near the full deployment Nevada/Utah DDA and possible OB locations that could be involved in large-scale migration in response to economic opportunities generated by M-X related activities.

Given the web of Native American kin relations throughout the Great Basin, their economically depressed condition, and their traditional pattern of migration, it is expected that Native American migrants in search of employment would gravitate toward reservations and colonies proximal to centers of economic activity.

There are no hard data with which to describe either baseline Native American economic migration in the Great Basin or with which to predict their response to economic opportunities. It is known that many have migrated to urban areas to take advantage of economic opportunities. As economic development has occurred on reservations and colonies, they have received a corresponding inflow of migrants back from the cities.

Reservations in and adjacent to the Nevada/Utah full deployment DDA and OB locations are expected to receive migrants from more peripheral reservations and colonies. Given the generally depressed economic condition of Native Americans in the region--their chronic unemployment and underemployment--a great deal of unidirectional migration to these new economic foci will occur. The primary receiving reservation would be the Duckwater Reservation (population 124) in the center of the Nevada DDA. The Moapa Reservation (population 189) adjacent to the potential Coyote Springs OB, the Ely Colony (population 187), adjacent to the potential Ely OB, and the Goshute Reservation (population 602) are more peripheral to the proposed DDA, but could become destinations to job-seeking migrants. Similarly the Cedar City Colony (population about 177), the Kanosh Reservation (population about 73), and the Shivwits Reservation (population about 65 on the reservation) could become a destination for those seeking jobs on the potential OB at Beryl, Milford, or Delta. Not only job seekers, but their dependents would base themselves near job opportunities. Given the relatively small populations of these reservations and colonies a relatively small number of migrants could effect a large percentage change in reservation and colony population. The BLM has suggested a doubling or tripling of the population of receiving reservations and colonies.

There are a number of short-term consequences occasioned by an increase in economic in-migration. Most of these potential impacts are comparable to those that may occur within non-Indian communities (schools, housing, etc.) an additional complication would be present, however, since reservations and colonies receive funding on the basis of enrolled residents; an influx of unenrolled residents would not be met by an increase in funding. All of these would combine to stress social relations and cultural homogeneity.

Since most new jobs occur during construction, it is anticipated that most migrants would return home after the construction phase. Wages earned and job training would provide valuable benefits to their home reservation but returnees could also stress the economic resources and infrastructure of their home reservations where generally depressed economic conditions exist.

Under split deployment, fewer jobs and less activity surrounding the Duckwater Reservation would make it less an attraction for economic migrants. The Ely Colony, Goshute Reservation, and the reservations and colonies of the Utah Southern Paiutes would similarly be less attractive due to their relative distance from centers of activity. Instead they could become net suppliers of migrants.

Mitigation of the consequences of migration are difficult to suggest. Assistance to reservations and colonies receiving migrants--for the provision of more housing and services--is essential. Paradoxically, the maximization of Native American employment in M-X generated activities would also be a mitigation, for it would mean that they would receive some monetary compensation for economic displacement and future economic disturbance. Assistance toward economic development at all reservations and colonies would limit migration somewhat by providing alternative economic foci, and would provide a viable post-construction economic base to ease the transition back to a post M-X construction.

The isolation, both physical and sociocultural, that characterizes Native Americans in the Great Basin is a two edged sword. It limits the services and ease of communication which many Americans, both rural and urban, take for granted. It also provides the opportunity for cultural autonomy and the kind of face-to-face interactions that limit anti-social behavior and generate feelings of community.

In the short term, this isolation will end for some of these reservations under the Nevada/Utah full deployment option. Even under split deployment at least the Duckwater Reservation will no longer have the isolation that both protects and nourishes Shoshone cultural persistence--a persistence that continues perhaps in part because of isolation from the non-Indian world and the mutual inter-dependence of Duckwater residents.

This isolation will be impacted in several ways under Nevada/Utah full deployment. Construction camps and crews will create a large change in reservation vicinity population ratios. In the short term, at least, Native Americans will be a minority even in their own 'neighborhoods.'

There will be an obvious contrast between generally well-paid construction workers and the economically depressed Native Americans of the Nevada/Utah region.

Interactions between Native Americans and the new, but temporary force of imported labor will generate unpredictable effects. If they interact as equals both socially and economically, these interactions could be a valuable experience for both groups. If they meet as unequals, either socially or economically, this could be the basis for negative perceptions of each group by the other and promote racism.

IMPACTS SPECIFIC TO OB SITES (4.2.4)

Beryl (4.2.4.1)

No Southern Paiute aboriginal sites are currently documented for the southern Escalante Desert area near Beryl. Although survey data are incomplete, present information suggests that the greatest potential for cultural resource loss associated with OB siting in the Beryl area occurs in surrounding mountainous areas. These higher elevation zones are rich in springs and pinyon groves, and are expected to contain a large number of ancestral sites and other culturally sensitive areas. The disturbance of aboriginal campsites, if present, is most likely to occur along ephemeral streams which emanate from the southern Wah Wah and Needle ranges and traverse areas proposed for the OB and DAA facilities (see Section Alternative 1).

Whereas negative impacts to cultural resources in the Escalante Desert are expected to be minimal, proposed construction of facilities north of the DAA pose a very high disturbance potential. The DTN which connects the Escalante Desert with Pine Valley will proceed through pristine areas of a major pass known to be associated with dense aboriginal settlements. Additional, construction of the DTN in this region will require the removal of pinyon trees, a cultural resource which is highly sensitive to local Southern Paiutes.

The anticipated increased recreational use of regions adjacent to the proposed base facilities during the construction and operations phases could threaten the integrity of Southern Paiute historic and cultural resources, the majority of which have not been systematically recorded. The expected radius of short- and long-term impacts are noted below in Table 4.4.1-4.

Archaeological surveys will precede construction activities in all areas of proposed ground disturbance. As part of the mitigation program, Southern Paiutes from the Shivwits, Cedar City, and Indian Peaks bands should be provided the opportunity to independently evaluate these areas. This measure will ensure that all cultural resources are properly inventoried. Consultation with these tribal governments should continue through the construction period to develop acceptable measures for mitigating unavoidable impacts to culturally sensitive sites and features.

Currently, there are no Indian reserves in close proximity to the Beryl proposed OB site. However, the recent (April 1980) reinstatement of the Utah Southern Paiutes to federal trusteeship has implications for proposed land use in Iron County in general and for the OB vicinity in particular. Public Law 96-227 provides that the five bands of Southern Paiutes which were terminated in 1954 be reinstated and that their reservation lands be restored to the extent possible. Where original reservation lands cannot be restored the law provides for the acquisition of up to

15,000 acres. Iron County is one of the five Utah counties from which land can be withdrawn for reservation restoration. Since the Cedar City band is in Iron County and since this band, which has over 100 enrolled members, has never had any land, it is expected that a reservation will be created in the Cedar City vicinity in Iron County.

The Indian Peaks reservation, created in 1915, was located about 25 mi north of Beryl in Beaver County. The reservation consisted of 14 sections of land, about 9,000 acres, 18 mi north of the proposed OB. There is a possibility that these original reservation lands will be restored to the Indian Peaks band. The lands were purchased by the state of Utah, shortly after the band was terminated in 1954, and made into a Game Management area. The land is intact; none is privately owned. If the original reservation land is not restored, lands surrounding the original reservation may be likely candidates for reservation restoration, in which case the proposed OB site and possible proposed withdrawal lands could conflict.

Indirect social and economic impacts on Native Americans are expected because of the proximity of Beryl to Cedar City, Shivwits, St. George, and other towns in which Southern Paiutes are currently living. The Southern Paiutes are an economically depressed Native American tribe and the Beryl area would probably become the focus of attention for other unemployed Native Americans as well.

Estimates of the numbers of Native Americans who might migrate into the area in search of employment are hampered by the tentative estimates of Southern Paiutes in the region. It is estimated that the population of Utah Southern Paiutes will be at least double that currently enrolled and the labor force is expected to increase substantially.

The Cedar City community is not expected to be able to absorb the increased population of workers and the family members of those who come in search of employment. Housing facilities here are inadequate to accommodate newcomers, and no federal money would become available since these in-migrants would not be enrolled members of the Cedar City band of southern Paiutes. (See sections 4.2.2 (Nevada/Utah), 4.2.4.3 (Delta), and 4.2.4.5 (Milford) for further information on possible impacts and suggested mitigations to Utah Southern Paiutes.)

Site-specific information on the physical and socioeconomic environment of the Utah Southern Paiutes has recently been collected by a field research team. Because type and extent of impact will be site-specific, these data, when analyzed, will allow better impact projections.

For a discussion for appropriate cultural resource mitigation measures, see Section 4.2.5.

Coyote Spring (4.2.4.2)

Farming is fundamental to the Moapa Indian reservation's economic base. Land withdrawal and water use, therefore, are expected to be issues of central concern to the Moapa Southern Paiutes.

The proposed OB complex site at Coyote Spring will not directly impact reservation lands or the acreage currently slated for Moapa Reservation expansion.

However, the proposed site does fall within the 1874 reservation boundaries, and withdrawal of that land for the M-X could be considered an economic threat. The Moapa band of Southern Paiutes has indicated an intention to recover those former lands.

The site is upstream from the Muddy River Springs, east of the Sheep Range in an area traversed by the waters which ultimately discharge at Muddy River Springs and other springs used by the Moapa reservation.

The proposed action operating base at Coyote Spring would directly affect the water flow of the Muddy River and indirectly impact Moapa Reservation present and pending agricultural land resources. Water demands for the operation of the base at Coyote Spring would be about 4,000 acre-ft per year peak demands would be as high as 4,400 acre-ft/year. When this usage is combined with construction demands of clusters upstream in the White River drainage system up to 10,500 acre-ft-yr of groundwater could be used during the short-term construction years. This utilization would significantly affect the flow of the Muddy River Springs and the Muddy River, the lower outlet for the White River drainage, with a total flow of 36,000 acre-ft per year. This discharge is the long-term perennial yield of the Coyote Spring, Kane Springs, and Muddy River Springs subunits (Eakins, 1964:25).

During the long term, operations at the OB would require removal of 4,000 acre-ft/year at Coyote Springs for 30 years of operation which would, directly reduce the flow of Muddy River Springs for the life of the base. Total recharge in the coyote Spring, Kane Springs, and Muddy River Springs areas combined, from precipitation alone is only 2,600 acre-ft/year (Eakins 1964:22).

Under existing conditions the Muddy River springs are fed by groundwater originating in the Coyote Spring, Kane Springs, Pahroc, Pahrnagat, Dry Lake, Delamar, White River, Long, Jakes, Cave, Garden, and Coal valleys. Flow at the Muddy River Springs is relatively constant and feeds the agricultural, stock raising, domestic, and craft needs of the Moapa Reservation as well as those of other users in the Muddy Valley. The Moapa Reservation presently diverts 12 cfs from the Muddy River, fully 24 percent of the discharge of the Muddy River Springs (26 percent of the streamflow of the Muddy River at Moapa). Water use on the reservation is already 6.8 times that allotted under state decree. A reduction in the flow of the Muddy River Springs would directly reduce Moapa access to water and diminish present and planned economic activities (especially greenhouse horticulture and cattle operations) (Eakins, 1964:1; Eakins, 1966; Facilitators Inc., 1980).

A reduction in the flow of the Muddy River would also limit water available for the development of the Moapa Reservation expansion. Water for these expansion lands would be available after the demands of more senior users are met. Depletion of the groundwater upstream, including a short- or long-term lowering of the water table, would have a corresponding effect on the productivity of the Muddy River Springs.

Mitigation of the water problem at Coyote Spring can best be dealt with by avoidance. Avoidance could take the form of purchases of surplus water from Las Vegas covering construction and operation needs during the lifetime of the base. This would relieve any stress of local groundwater resources. Wastewater from the base could then be a resource itself, helping to improve regional groundwater

resources or used for agriculture, especially by the Moapa who face a water deficit in developing their proposed expansion. Unforeseen consequences of such a mitigative strategy would have to be investigated.

Other than by avoidance, mitigation would be accomplished by the adoption of a strict water regime to minimize use: landscaping with native plants that require no irrigation, rejection of plans for watered recreational areas, flow restrictions on showers, automatic faucet shutoffs, the use of waterless toilets, and minimum possible use of water for health and hygiene. These strategies would reduce base water consumption to a very low level.

The recent economic history of the Moapa band and the plans for future economic development on the reservation indicate that the Moapa band is striving to become economically independent, and is meeting with measurable success. Income for the Moapa Indians is generated from farming and ranching and some of the Indians have construction jobs, work in the leather shop, or in the greenhouses.

The job opportunities which site construction make available are expected to be attractive to Native Americans whose economical circumstances are generally depressed. Construction of an OB near the Moapa reservation would make that reservation attractive for friends and relatives of the Moapa people in search of employment. The distances are not prohibitive and the promise of work nearby is expected to create an influx of unenrolled Southern Paiutes, as well as members of other tribes, into the Moapa reservation itself.

Some of the in-migrating Native Americans will obtain jobs created by M-X. While the housing situation on the reservation has been steadily improving over the last few years - there are 34 units now and 10 more are under construction - the population influx would render the housing facilities inadequate. Since most of the newcomers would not be enrolled members of the Moapa band, federal money for reservation housing would not be provided. While there are no schools or health facilities on the reservation itself, those in the nearby community of Overton would be utilized by the in-migrating Native Americans. (See Sections 4.2.2 and 4.2.3 for further details on possible impacts and some suggested mitigations to the Moapa Reservation.)

Detailed cultural resource and socioeconomic data collected at the Moapa Reservation are being analyzed to refine the impact assessment.

Delta (4.2.4.3)

Potential direct and indirect impacts on Native American ancestral/sacred sites are discussed in Alternative 2. Nothing is currently known about possible uses of the OB siting area by contemporary Indians for hunting, gathering, or other traditional activities. Southern Paiutes at the Kanosh Reservation, some 50 mi southeast of the proposed OB, have expressed concern for the preservation of ancestral habitation sites, ceremonial sites, burial areas, and native floral and faunal resources in the vicinity of the reservation, and in the adjacent Pahvant Range (U.S. Forest Service, 1974; Facilitators, Inc., 1980). Further research is needed to determine the extent of potential indirect impacts to such cultural resources in the Fishlake National Forest due to increased recreational demand and activity.

Construction of an operating base at Delta would not directly impact any Native American land or water resources. It is unlikely, albeit possible, that conflict between M-X and Utah Southern Paiute land withdrawals could occur. Up to 15,000 acres of land will be withdrawn from among federal, state, and private lands in any of five Utah counties to provide reservations for the Utah Southern Paiute Bands recently reinstated to federal trusteeship.

The prepared OB at Delta is about 50 mi northwest of the Native American Colony at Kanosh. Job opportunities at Delta are expected to stimulate the in-migration to Kanosh of friends and relatives of Kanosh members. (See Sections 4.2.2 and 4.2.3 (Nevada/Utah), 4.2.4.1 (Beryl), and 4.2.4.5 (Milford) for further information on possible impacts and suggested mitigations to Utah Southern Paiute.)

Ely (4.2.4.4)

Potential direct and indirect impacts to Shoshone ancestral/sacred sites are discussed in Alternative 3. Pine-nut gathering areas and hunting areas in the Schell Creek, Egan, and Cherry Creek mountain ranges may be subject to indirect impacts as a result of rapid population growth in the Ely area. The projected 237 percent increase in the White Pine County population as a result of OB siting will create new recreational demands and encourage the development of new facilities, such as mountain campgrounds and ski resorts. Similarly, demand for seasonal hunting permits may be expected to increase, thereby placing Native Americans in competition with newcomers for legal rights to exploit deer and other game necessary for subsistence. Little is currently known about the gathering of native food, craft, or medicinal plants by members of the Ely Colony. Further study is required to assess potential impacts on these resources.

M-X OB construction in the vicinity of Ely is expected to directly impact the Ely Colony and have indirect impacts on other Indian reserves in the area, including the Duckwater Reservation 70 mi southwest of Ely. Ely is expected to attract Native Americans and others in search of work as a large number of jobs will become available in the area. The Native American population in the community is expected to at least double or triple, and could cause severe problems in the Colony.

In-migration and rapid growth will limit traditional Native American activities, diminish traditional values, and decrease their importance in the area. The rapid in-migration of Native Americans and other groups into the Ely/Ely Colony area will have other socioeconomic effects as well. The housing situation at the Colony is poor; there are only 17 housing units in standard condition and at least 22 new units are needed to replace substandard units and to meet demand (Facilitors, Inc., 1989). Population in-migration will likely further stress housing markets. (See Section 4.2.2 and 4.2.3 for further information on possible impacts to the Native Americans at the Ely Colony.)

Detailed cultural resource and socioeconomic data collected at Ely Colony are being analyzed to refine the analysis of the impacts of a potential base site on Native Americans.

Milford (4.2.4.5)

Potential direct and indirect impacts to Native American ancestral/sacred sites are discussed under the Proposed Action and Alternative 5. Nothing is

currently known about possible uses of the OB siting area by contemporary Indians for hunting, gathering, or other traditional activities. An accurate assessment of impacts associated with base construction in this area must await the identification of specific sensitivity areas by local Southern Paiutes.

Archaeological surveys will precede construction activities in all areas of proposed ground disturbance. As part of the mitigation program, Southern Paiutes from the Cedar City and Kanosh bands should be provided the opportunity to independently evaluate these areas. This measure will ensure that all cultural resources are properly inventoried. Consultation with these tribal governments should continue through the construction period to develop acceptable measures for mitigating unavoidable impacts to culturally sensitive sites and features.

Currently, there are no Indian reserves in close proximity of the Milford proposed OB site. However, the recent (April 1980) reinstatement of the Utah Southern Paiutes to federal trusteeship has implications for proposed land use in Beaver County. Public Law 96-227 provides that the five bands of Southern Paiutes which were terminated in 1954 be reinstated and that their reservation lands be restored to the extent possible. Where original reservation lands cannot be restored, the law provides for up to 15,000 acres of land to be acquired; Beaver County is one of the five Utah counties from which land can be withdrawn for reservation restoration.

The Indian Peaks reservation, created in 1915, was located about 50 mi west of Milford in Beaver County. The reservation lands, about 9,000 acres, were purchased by the state of Utah when the Indians, shortly after termination, found they could not pay the property taxes. It is possible that the original reservation lands could be restored to the Indian Peaks band. The state converted the land into a Game Management area and the entire acreage is intact; none is privately owned. If the original reservation land is not restored, however, other public lands in Beaver County may be candidates for reservation restoration and conflicts over land withdrawal for the OB site could arise.

Construction of an OB at the Milford site would not directly impact any Indian reservations or colonies. Indirect social and economic impacts on Native Americans are expected because of the proximity of Milford to Utah towns in which Southern Paiutes are currently living. The Cedar City Colony, 50 mi to the south, consists of ten acres of land owned by the Mormon Church. There are 100 enrolled members of the band, 75 of whom live in Cedar City, though not necessarily at the Colony itself. Additionally, most of the Indian Peaks band moved to Cedar City following termination from federal trusteeship, and the subsequent loss of their land. The Kanosh and Koosharem bands, living in the towns of Kanosh and Richfield, respectively, are less than 60 mi from Milford and the Shivwits reservation, and the town of St. George where most of the 290 enrolled members of the Shivwits band live, are about 100 mi south of Milford.

The Southern Paiutes are an economically depressed Native American tribe. Colony lands in Utah are residential; there is no agriculture or other economic base for most of the bands. Unemployment is high; most employment is seasonal and/or temporary wage labor. The income derived from this work is minimal and the average per capita income is under \$700/year. Given these economic circumstances, a large-scale construction project with an estimated 400, 800, and 1,050

civilian jobs for the first three years would be expected to be very attractive to an economically-deprived segment of the population. Then with employment projections of 500, 700, 1,500, 2,000, and 2,400 for the succeeding five years, the Milford area would probably become the focus of attention for unemployed Native Americans.

Estimates of the numbers of Native Americans who might migrate into the area in search of employment are hampered by the tentative estimates of Southern Paiutes in the region. Prior to the April 1980 reinstatement of the Utah Southern Paiutes, there were 545 enrolled members of the five bands (and an additional 294 Southern Paiutes at the Las Vegas Colony and Moapa reservation in Nevada). With reinstatement, however, the "final membership role is declared open" (Public Law 96-227 Section 4, pg. 318) and individuals who can show that: (a) they were enrolled in a band in 1954 or were on the 1968 rolls drawn up for funds disposition, or (b) were entitled to be either on the 1954 or 1968 rolls but were not listed, and (c) are a descendent of an individual qualifying in (a) or (b) above and are one-quarter Paiute "shall be a member of the tribe" (Public Law 96-227 Section 4, pg. 318). The number of Paiutes who fall into these categories is not yet known, but it is estimated that the population of Utah Southern Paiutes will be at least double that currently enrolled and the labor force is expected to increase substantially.

None of the Native American communities in close proximity to the Milford site (Cedar City, Kanosh, and Richfield colonies) would be expected to absorb the increased population, the family and other relatives of workers and would-be workers. It would render the housing facilities inadequate, and, since most of the newcomers would not be enrolled members of the local band, Kanosh, Koosharem, or Cedar City, federal money for reservation housing would not be provided.

Site-specific information on the socioeconomic environment of the Utah Southern Paiutes collected by a field research team is currently being analyzed to refine impact projections. (See Sections 4.2.2 and 4.2.3 (Nevada/Utah), 4.2.4.1 (Beryl), and 4.2.4.3 (Delta) for further information on potential impacts to Utah Southern Paiute communities.)

MITIGATION (4.2.5)

Mitigation measures designed to avoid, lessen, or alleviate impacts to Native American cultural and socioeconomic resources are applicable during the siting, construction, and operations phases of the M-X program. Successful measures require the participation of Native Americans in the impact assessment and mitigation process. Some preliminary suggestions, however, may be made on the basis of current data.

Cultural Resources

A Programmatic Memorandum of Agreement (PMOA) for the preservation of historic properties (archaeological, historic, and architectural resources) has been negotiated between the Air Force, Office of Historic Preservation, and the Bureau of Land Management. The PMOA establishes procedures for compliance with existing federal laws which protect cultural resources. Native American ancestral/sacred sites, as properties eligible for nomination to the National Register of Historic Places, are included in the terms of this agreement. The PMOA and other mitigative measures will be in effect during various phases of the project.

Mitigations relevant to Native American cultural resources involve both areal and regional/local siting decisions. Nevada/Utah has greater overall sensitivity for contemporary peoples than does Texas/New Mexico, where cultural resources are less densely distributed and where Native American attachments to deployment area lands have less spatial and temporal continuity. Full or partial siting of the project in the latter two states, therefore, will lessen the overall severity of M-X cultural resource impacts. Within local siting regions, the principal form of mitigation is flexibility in the placement of project facilities in order to maximize avoidance of sites and areas which are known to be of cultural and religious significance to Native Americans. An inventory of these sensitive features will be accomplished at three levels: (1) review of existing site data, (2) site data collected from reservation and colony field studies, and (3) onsite pre-construction archaeological and ethnographic survey of areas in which ground disturbance is proposed. The inclusion of Native American cultural resource specialists from local reservations on these pre-construction survey teams will refine the identification procedure and thereby mitigate potential adverse effects.

Cultural resource mitigations applicable to the construction phase concern procedures to be followed in the event of accidental or unavoidable disturbance of sensitive sites or features. A number of mitigative strategies will be developed in consultation with appropriate local tribal governments via liaisons established during the pre-construction onsite survey program. Mitigations, which will vary according to the situational context, include data recovery and selective avoidance. In coordination with the BLM and SHPO, excavated artifacts may be returned to local Indian reservations for curation and/or display at existing or proposed tribal museums. Similarly, rare floral species utilized by Native Americans for food, medicinal, or craft purposes may be preserved by transplantation at on-reservation botanical gardens. Financial assistance for the development of tribal museums and botanical gardens is a potential compensatory mitigation. In some instances of accidental disturbance of cultural resources, site or feature avoidance may be instituted. If, for example, burial grounds are discovered during excavations for sand or gravel, borrow pit operations may be relocated to alternate areas. Similarly, a DTN segment may be moved to avoid highly sensitive cultural resources discovered during preliminary ground disturbance.

Indirect impacts to Native American cultural resources are expected during the operations phase as a result of public use of the DTN for recreational access to previously undisturbed wilderness areas. Since site destruction through pilfering, vandalism, and ORV ground disturbance cannot be effectively controlled over large regions by security patrols, a cultural resource monitoring program is the most feasible mitigative measure. This program will take the form of follow-up archaeological and ethnographic field studies to determine long-range project effects and to develop, as necessary, secondary mitigative programs to promote cultural resource preservation.

Socioeconomic Resources

Mitigations relevant to the socioeconomic resources of Indian reservations and colonies also include areal and local siting factors. Since no Indian reserves are located in or immediately adjacent to the Texas/New Mexico deployment area, a siting decision which results in partial or full utilization of this region for M-X will minimize adverse effects. In Nevada/Utah, potential impacts to Native American

land and water resources may be mitigated through planned avoidance. Land areas considered exclusionary include tribal grazing lands and proposed reservation land withdrawal areas. Due to the protection provided Indian tribes under federal law, and the typically non-negotiable position assumed by tribal governments, planned avoidance of the surface and groundwater resources of Indian reservations and colonies during the project siting phase is a recommended mitigative strategy.

Mitigations relevant to the socioeconomic resources of reservations and colonies have been partially incorporated in siting analysis and decisions to date. No project features will be sited on reservation lands, and lands identified as additional reservation withdrawals have been purposely avoided. Specific evaluation of potential impacts on grazing areas of Indians and non-Indian alike will continue.

Mitigations appropriate to socioeconomic features of Indian reservations during the construction phase include job-training and job recruitment programs for Native Americans in the deployment area, and increased federal aid to alleviate infrastructural impacts associated with projected population influxes. Mitigations may also include arrangements with the OEA for waiver of the matching-funds requirement where such requirement cannot be met by economically disadvantaged reservations or colonies.

4.3 IMPACT SIGNIFICANCE ANALYSIS

The purpose of the impact significance analysis is twofold. First, it is necessary to determine the relative significance of the range of resources found in the affected environment. For example, cultural resources encompass a wide variety of sites, features, and biota including ancestral settlements, burial areas, historic event sites, cosmological event sites, ancestral trails, hot springs, rock art sites, ceremonial/ritual sites, homes of spiritual beings, sacred materials (medicinal plants, sacred stone quarries, sacred paint clays, sacred feathers, sacred animal skins and other body parts) traditional food gathering areas (pine-nuts and other native plants), traditional hunting areas, and traditional craft materials (basketry and cradleboard materials, pottery materials, etc.). While all of these cultural resources are included in the DEIS analysis, they have varying degrees of cultural and legal significance in the Native American community and in the larger society. The second purpose of the impact significance analysis is to determine the relative intensity of effect which the project will have on these resources.

RESOURCE SIGNIFICANCE CRITERIA (4.3.1)

The relative significance of Native American cultural and socioeconomic resources was assessed on the basis of six general criteria. These criteria are designed to incorporate factors important to National Register site eligibility, Native American religious freedom, and the special trust relationship and responsibilities of the federal government to federally recognized Indian tribes (see Section 1.1):

1. Degree of expressed concern-- Native Americans have expressed concern in several forums about specific resources and potential effects. In scoping meetings, tribal council resolutions and communications, and field investigations, three broad categories have been consistently identified: cultural resources resources (water accessibility, reservation

lands, grazing lands, treaty lands, and proposed reservation expansion lands), and human resources (migration, labor force, cultural persistence, and relative isolation and physical ambience).

2. Site or resource uniqueness-- This criterion considers the extent to which the destruction of a site or resource would represent a serious or irreplaceable loss to the Native American community. Rock art sites, for example, each contain a unique configuration of art motifs and symbols. The destruction of such sites results in permanent loss of cultural information as well as a shrine where communication with the spirit-world is possible. Natural resources may also be characterized by uniqueness. The water supply and lands of an Indian reservation (either present or potential) represent unique and irreplaceable resources if their reduction or appropriation causes undue economic hardship, either in the short or long term.
3. Resource variety in a site or zone-- This criterion considers the degree of geographical concentration of sites or resources in areas subject to direct or indirect impacts. An area which contains ancestral settlements, burials, and pinyon groves, for example, would be of higher significance than a similar area containing only lithic scatters, due to the greater density of cultural resources. Sites which fall into such regional clusters would be judged highly significant to demarcate important resource concentrations.
4. Past and present usage-- This criterion assumes that sites and resource areas which continue to be exploited or used in the traditional manner by contemporary Indians will have greatest cultural significance, due to the general decline in the number of these specialists, have less significance than pinyon groves, which are associated with a continuous pattern of exploitation from ancient to modern times. This criterion further assumes that the relative proportion of specific Indian reservation populations which is actively involved in the utilization of subject sites or resources will similarly affect degrees of expressed concern. Traditional basketry or pottery materials, for example, when exploited by only a small number of tribal elders for individual use will be accorded less significance than when such resources are associated with reservation programs to revitalize traditional crafts and/or tribal enterprises.
5. Scientific significance-- This criterion assess the extent to which Native American sites and resource areas have independent importance in the scientific community. A site which is regarded as culturally significant by contemporary Indians, for example, may also be eligible for listing on the National Register of Historic Places. Its overall significance would thereby be enhanced. Scientific significance also includes the importance of Native American participation in traditional rites and activities which promote cultural persistence. The preservation of resources, such as sacred sites or pinyon groves, associated with such rites and activities is central to ethnographic research and the understanding of human cultures.
6. Cultural persistence-- This criterion concerns the importance of the resource in the maintenance of a distinctive (but not necessarily static)

Native American culture and society. This criterion is especially appropriate in judging potential impacts on the human environment. For example, an increase in the migration of Native Americans to a few reservations to take advantage of economic opportunities generated by M-X activities is both a resource (the population at both the receiving and supplying reservations) and an impact (it stresses the infrastructure, social relationships, and cultural norms and values of both the receiving and the supplying reservations).

IMPACT SIGNIFICANCE DETERMINATION (4.3.2)

Native American cultural and socioeconomic resources which received high significance rankings on the basis of the six criteria are ancestral/sacred sites and areas, water accessibility and agricultural land use, and migration. These resources were subjected to further analysis to determine the nature and relative intensity of impacts posed by potential M-X deployment. Considerations in this impact significance determination included factors such as the legal status of the resource, and the measureability and geographical extent of direct and indirect impacts; the effect of disturbance on resource the consequences of resource impacts on future uses, mitigation expenditures, and the socioeconomic features of local communities. For each relevant factor, the three Native American resources were ranked on an effect intensity scale of one to five. Impact significance analyses for ancestral/sacred sites and areas, water accessibility and agricultural land use, and Native American migration are found in appendix A.

4.4 IMPACT SIGNIFICANCE LEVELS

This section summarizes in tabular form the results of analyses of significant resources significantly impacts for the Proposed Action and project alternatives. Criteria utilized in the assignment of impact significance levels for cultural and socioeconomic resources in DDA and other affected hydrologic subunits are discussed.

CULTURAL RESOURCES (4.4.1)

Tables 4.4.1-1 through 4.4.1-7 summarize projected impacts to Native American ancestral/sacred sites discussed in Section 4.2.1.1 above.

Potential short-term and long-term effects for the Proposed Action and alternatives 1-6 appear in Table 4.4.1-1. Short-term effects include direct impacts during construction due to ground disturbance, and indirect effects within a radius of construction activities. Current information on direct impacts is limited to known sites which occur within a one-mile radius of construction activities, and is therefore incomplete. the short-term indirect potential is estimated on the basis of the proximity of construction camps and project roadways to sensitive areas. The indirect impact potential is rated high if the subunit contains a construction camp and/or extensive roadways; moderate if a construction camp is located in an immediately adjacent subunit and/or if moderate incursion of roadways in sensitive areas is present; or low if the subunit is not proximal to a construction camp and/or if little or no incursion of roadways is present. The overall short-term impact is a cumulative index of both direct and indirect effects, i.e., the level of proposed ground disturbance during construction, proximity of construction activities to

Table 4.4.1-1. Potential impacts to Native American ancestral/sacred sites in Nevada and Utah DDA for the Proposed Action and for alternatives 1-6.

HYDROLOGIC SUBUNIT		ABUNDANCE INDEX ¹	SHORT-TERM EFFECTS			LONG-TERM EFFECTS	
NO.	NAME		NUMBER OF DIRECT IMPACTS TO KNOWN SITES	INDIRECT IMPACT POTENTIAL ²	POTENTIAL IMPACT ³	NUMBER OF KNOWN SITES SUBJECT TO INDIRECT IMPACTS	POTENTIAL IMPACT ⁴
Subunits with M-X Clusters and DTN							
4	Snake		4			16	
5	Pine		0			10	
6	White		2			19	
7	Fish Springs		1			4	
8	Dugway		0			0	
9	Government Creek		0			4	
46	Sevier Desert		2			10	
46A	Sevier Desert & Dry Lake ⁵		0			2	
54	Wah Wah		0			0	
137A	Big Smokey—Tonopah Flat		0			3	
139	Kobeh		0			4	
140A	Monitor—Northern		0			6	
140B	Monitor—Southern		0			3	
141	Ralston		1			3	
142	Alkali Spring		0			0	
148	Cactus Flat		0			3	
149	Stone Cabin ⁵		3			13	
151	Antelope		0			1	
154	Newark ⁵		0			6	
155A	Little Smoky—Northern		2			0	
155C	Little Smoky—Southern		2			1	
156	Hot Creek		1			21	
170	Penoyer		0			1	
171	Coal		0			5	
172	Garden		3			2	
173A	Railroad—Southern		1			0	
173B	Railroad—Northern		8			18	
174	Jakes ⁵		0			8	
175	Long		0			4	
178B	Butte—South		0			1	
179	Steptoe		0			22	
180	Cave		1			6	
181	Dry Lake ⁵		4			4	
182	Delamar		2			2	
183	Lake		2			4	
184	Spring		0			34	
196	Hamlin		0			4	
202	Patterson		0			2	
207	White River		0			5	
208	Pahroc		0			7	
209	Pahrnagat		0			32	
Overall DDA Impact							

2888-1



No impact.

Low impact (or abundance).



Moderate impact (or abundance).

High impact (or abundance).

¹The abundance index is a best estimate based upon three major criteria: (1) known site densities, (2) predicted site densities, as indicated by historic aboriginal tribal distributions and water availability, and (3) general sensitivity, as indicated by preliminary field data.












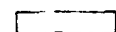

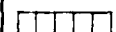












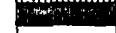




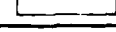
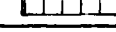
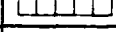
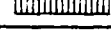





²High (construction camp in subunit and/or extensive roadways in sensitive areas), moderate (construction camp in immediately adjacent subunit and/or moderate incursion of roadways in sensitive areas), low (not proximal to construction camp and/or little or no incursion of roadways in sensitive areas).

³The short-term impact rank is a best estimate based upon the relative proximity of known and predicted site areas to M-X construction areas, and to in-migrant population (e.g., construction camps and Area Support Centers).

⁴The long-term impact rank is a best estimate based upon the cumulative effects of construction plus the indirect effects projected during the operations phase. Key factors in the long-term disturbance are proximity to ASCs and the degree of public accessibility provided by the DTN and cluster roads in each subunit.

⁵Conceptual location of Area Support Centers (ASCs).

Table 4.4.1-2. Potential impacts to Native American ancestral/sacred sites in the vicinity of Coyote Spring for the Proposed Action and for alternatives 1, 2, 4, and 6.

HYDROLOGIC SUBUNIT		ABUNDANCE INDEX ¹	SHORT-TERM EFFECTS			LONG-TERM EFFECTS	
NO.	NAME		DIRECT IMPACT POTENTIAL ²	INDIRECT IMPACT POTENTIAL ³	POTENTIAL IMPACT ⁴	NUMBER OF KNOWN SITES SUBJECT TO INDIRECT IMPACTS	POTENTIAL IMPACT ⁵
Hydrologic Subunit OB Location							
210	Coyote Spring					2	
219	Muddy River Springs					2	
Other Affected Subunits ⁶							
181	Dry Lake					8	
182	Delamar*					4	
205	Meadow Wash (OB RR Spur					0	
206	Kane Springs*					8	
209	Pahrnanagat*					32	
218	California Wash					1	
Overall OB							

3889

-  No impact.  Moderate impact (or abundance).
 Low impact (or abundance).  High impact (or abundance).

¹Specific site data are scant for the Coyote Spring region. High site densities are expected throughout this region, however, on the basis of known historic Southern Paiute settlement and migration patterns.

²An estimate of direct impacts to unrecorded sites is based on relative proximity to construction activities. Hydrologic units with asterisks (*) are subject to direct impacts, with the exception of Alternative 4 (in which the DTN segment and OBTS are eliminated).











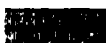
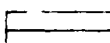
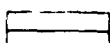
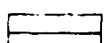


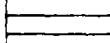
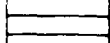
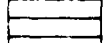


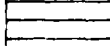
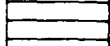
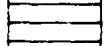


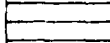
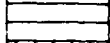
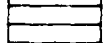


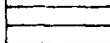
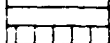
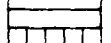


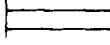

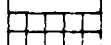


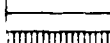



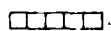

³An estimate of indirect short-term impacts is based on relative proximity to the construction camp associated with the OB.

⁴The short-term impact rank is an estimate of the combined effects of direct and indirect impact potentials.

⁵The long-term impact rank is an estimate of the cumulative effects of construction plus the indirect effects projected during the operations phase. Key factors in the long-term disturbance are proximity to the OB and the degree of public accessibility provided by the DTN and cluster roads in each subunit.

⁶Indirect effects are also expected in the adjacent Tikaboo-South (169B), Las Vegas (212), Hidden-North (217), Garnet (216), and Black Mountains (215) hydrologic units.

Table 4.4.1-3. Potential impact to Native American ancestral/sacred sites in the vicinity of Milford for the Proposed Action and for alternatives 5 and 6.

HYDROLOGIC SUBUNIT		ABUNDANCE INDEX ¹	SHORT-TERM EFFECTS			LONG-TERM EFFECTS	
NO.	NAME		DIRECT IMPACT POTENTIAL ²	INDIRECT IMPACT POTENTIAL ³	POTENTIAL IMPACT ⁴	NUMBER OF KNOWN SITES SUBJECT TO INDIRECT IMPACTS	POTENTIAL IMPACT ⁵
Hydrologic Subunit OB Location							
50	Milford*					0	
52	Lund					3	
Other Affected Subunits ⁶							
4	Snake					20	
5	Pine					10	
6	White					21	
46	Sevier Desert					12	
46A	Sevier Desert & Dry Lake ⁷					2	
53	Beryl-Enterprise District					7	
54	Wah Wah					0	
Overall OB							

3890-1

 No impact.
  Low impact (or abundance).
  Moderate impact (or abundance).
  High impact (or abundance).

¹ Estimates on site densities are made on the basis of known historic Southern Paiute settlement and migration patterns.

² An estimate of direct impacts to known and predicted sites is based on relative proximity to construction activities. Hydrologic units noted with asterisks (*) have disparate effects for the Proposed Action (no impact is expected in Wah Wah due to the elimination of the DTN; only moderate direct effects are expected in Milford with the elimination of the DTN, OBTS and DAA).

³ An estimate of indirect short-term impacts is based on relative proximity to the construction camp associated with the OB.

⁴ The short-term impact rank is an estimate of the combined effects of direct and indirect impact potentials.

⁵ The long-term impact rank is an estimate of the cumulative effects of construction plus the indirect effects projected during the operations phase. Key factors in the long-term disturbance are proximity to the OB and the degree of public accessibility provided by the DTN and cluster roads in each subunit.

⁶ Indirect effects are also expected in the adjacent Dixie Creek-Tenmile Creek (48), Parowan (49) and Cedar City (51) hydrologic units, as well as in the Pahvant Mountains to the east.

⁷ Conceptual location of Area Support Centers (ASCs).

Table 4.4.1-4. Potential impact to Native American ancestral/sacred sites in the vicinity of Beryl for alternatives 1, 3, and 4.

HYDROLOGIC SUBUNIT		ABUNDANCE INDEX ¹	SHORT-TERM EFFECTS			LONG-TERM EFFECTS	
NO.	NAME		DIRECT IMPACT POTENTIAL ²	INDIRECT IMPACT POTENTIAL ³	POTENTIAL IMPACT ⁴	NUMBER OF KNOWN SITES SUBJECT TO INDIRECT IMPACTS	POTENTIAL IMPACT ⁵
Hydrologic Subunit OB Location							
52	Lund*					3	
53	Beryl-Enterprise*					7	
Other Affected Subunits ⁶							
5	Pine*					10	
50	Milford					0	
54	Wah Wah					0	
198	Dry					7	
199	Rose					4	
200	Eagle					5	
201	Spring					9	
203	Panaca					9	
204	Clover					31	
Overall OB							

3891

No impact.
 Moderate impact (or abundance).
 Low impact (or abundance).
 High impact (or abundance).

¹Estimates on site densities are made on the basis of known historic Southern Paiute settlement and migration patterns, as well as on recorded sites.

²An estimate of direct impacts to known and predicted sites is based on relative proximity to construction activities. Hydrologic units noted with asterisks (*) have disparate effects for Alternative 1 (no direct impacts will occur in Pine Valley due to elimination of the DTN; no direct impacts will occur in Lund District due to elimination of the DTN and OBTS; impacts will be slightly less in Beryl-Enterprise due to elimination of the DTN segment).

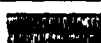
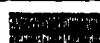

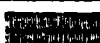


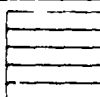





³An estimate of indirect short-term impacts is based on relative proximity to the construction camp associated with the OB.

⁴The short-term impact rank is an estimate of the combined effects of direct and indirect impact potentials.


⁵The long-term impact rank is an estimate of the cumulative effects of construction plus the indirect effects projected during the operations phase. Key factors in the long-term disturbance are proximity to the OB and the degree of public accessibility provided by the DTN and cluster roads in each subunit.


⁶Indirect effects are also expected in the adjacent Cedar City (51) and Parowan (49) hydrologic units, and in the Dixie National Forest to the south.

Table 4.4.1-5. Potential impact to Native American ancestral/sacred sites in the vicinity of Delta for Alternative 2.


HYDROLOGIC SUBUNIT		ABUNDANCE INDEX ¹	SHORT-TERM EFFECTS			LONG-TERM EFFECTS	
NO.	NAME		DIRECT IMPACT POTENTIAL ²	INDIRECT IMPACT POTENTIAL ³	POTENTIAL IMPACT ⁴	NUMBER OF KNOWN SITES SUBJECT TO INDIRECT IMPACTS	POTENTIAL IMPACT ⁵
Hydrologic Subunit OB Location							
46 46A	Sevier Desert Sevier Desert & Dry Lake ⁷					12 2	
Other Affected Subunits ⁶							
6 7 8 9 54	White Fish Springs Flat Dugway Government Creek Wah Wah					21 5 0 4 0	
Overall OB							

3892

 No impact.

 Moderate impact (or abundance).

 Low impact (or abundance).

 High Impact (or abundance).

¹Native American sites in the Delta area and adjacent hydrologic units are not well documented. Estimates of site abundance are based on known sites as well as known historic distributions of Goshute, Ute, and Southern Paiute Indians.

²An estimate of direct impacts to known and predicted sites is based on relative proximity to construction areas.

³An estimate of indirect short-term impacts is based on relative proximity to the OB construction camp.




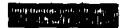



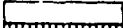





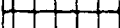


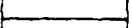




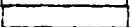
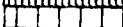
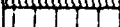




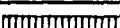
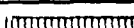



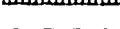
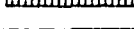


⁴The short-term impact rank is an estimate of the combined effects of direct and indirect impact potentials.

⁵The long-term impact rank is an estimate of the cumulative effects of construction plus the indirect effects projected during the operations phase. Key factors in the long-term disturbance are proximity to the OB, the degree of public accessibility, and the presumed attraction to higher elevation areas for recreation.

⁶Indirect effects are also expected in the Fishlake National Forest east of Delta.

⁷Conceptual location of Area Support Centers (ASCs).

Table 4.4.1-6. Potential impact to Native American ancestral/sacred sites in the vicinity of Ely for alternatives 4 and 5.

HYDROLOGIC SUBUNIT		ABUNDANCE INDEX ¹	SHORT-TERM EFFECTS			LONG-TERM EFFECTS	
NO.	NAME		DIRECT IMPACT POTENTIAL ²	INDIRECT IMPACT POTENTIAL ³	POTENTIAL IMPACT ⁴	NUMBER OF KNOWN SITES SUBJECT TO INDIRECT IMPACTS	POTENTIAL IMPACT ⁵
Hydrologic Subunit OB Location							
179	Steptoe					1	
Other Affected Subunits							
4	Snake					20	
174	Jakes ⁶					8	
178B	Butte—South					1	
180	Cave					7	
184	Spring					34	
207	White River					5	
Overall OB							

3993-1

No impact.

Low impact (or abundance).

Moderate impact (or abundance).

High impact (or abundance).

¹The Steptoe Valley region is known to have been a major population center for the Shoshone. Recorded sites represent only a small fraction of the total resource base. Estimates of site abundance are based on these known sites, as well as on known historic distributions of Shoshone Indians.

²An estimate of direct impacts to known and predicted sites is based on relative proximity to construction areas.
















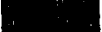





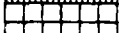



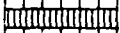




























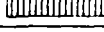
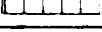






³An estimate of indirect short-term impacts is based on relative proximity to the OB construction camp.

⁴The short-term impact rank is an estimate of the combined effects of direct and indirect impact potentials.

⁵The long-term impact rank is an estimate of the cumulative effects of construction plus the indirect effects projected during the operations phase. Key factors in the long-term disturbance are proximity to the OB, the degree of public accessibility, and the presumed attraction to higher elevation areas for recreation.

⁶Conceptual location of Area Support Centers (ASCs).

Table 4.4.1-7. Potential impacts to Native American ancestral/sacred sites in Nevada/Utah split basing DDA, Alternative 8.

HYDROLOGIC SUBUNIT		ABUNDANCE INDEX ¹	SHORT-TERM EFFECTS			LONG-TERM EFFECTS	
NO.	NAME		NUMBER OF DIRECT IMPACTS TO KNOWN SITES	INDIRECT IMPACT POTENTIAL ²	POTENTIAL IMPACT ³	NUMBER OF KNOWN SITES SUBJECT TO INDIRECT IMPACTS	POTENTIAL IMPACT ⁴
Subunits with M-X Clusters and DTN							
4	Snake		3			17	
5	Pine		0			10	
6	White		0			21	
7	Fish Springs		0			5	
46	Sevier Desert		0			12	
46A	Sevier Desert & Dry Lake ⁵		0			2	
54	Wah Wah		0			0	
155C	Little Smoky—Southern		2			3	
156	Hot Creek		1			21	
170	Penoyer		0			1	
171	Coal		0			5	
172	Garden		3			2	
173	Railroad S & N		1			0	
180	Cave		0			7	
181	Dry Lake ⁵		4			4	
182	Delamar		2			2	
183	Lake		2			4	
184	Spring		0			34	
196	Hamlin		0			4	
202	Patterson		0			2	
207	White River		0			5	
208	Pahroc		0				
Overall DDA							

3894-1

- ¹  No impact.  Moderate impact (or abundance).
 Low impact (or abundance).  High impact (or abundance).

¹The abundance index is a best estimate based upon three major criteria: (1) known site densities, (2) predicted site densities, as indicated by historic aboriginal tribal distributions and water availability, and (3) general sensitivity, as indicated by preliminary field data.

²Very high (within 50 mi of the Coyote Spring OB); high (construction camp or other projects located in subunit); moderate (construction camp or other project located in immediately adjacent subunit); low (not proximal to OB, construction camp, or other project).

³The short-term impact rank is a best estimate based upon the relative proximity of known and predicted site areas to M-X construction areas, and to in-migrant population loci (OBs, construction camps, and other proposed project locations).

⁴1= high, 2= moderate, 3= low. The long-term impact rank is a best estimate based upon the cumulative effects of construction plus the indirect effects projected during the operations phase. Key factors in the long-term disturbance are proximity to the Coyote Spring OB and the degree of public accessibility provided by the DTN and cluster roads in each subunit.

⁵Conceptual location of Area Support Centers (ASCs).

sensitive areas, and the presence or absence of construction camps in or near the DDA valley. Long-term effects are, for the majority of valleys, predicted to be more intense than short-term effects, due to the non-renewable nature of the resource. Impacts to ancestral/sacred sites during the operations phase and beyond are associated with increased recreational use, vandalism, and illegal excavation. The long-term impact rank is an estimate based upon the cumulative effects of construction plus the indirect effects projected during the operations phase. Key factors in the long-term disturbance are proximity to Area Support Centers and the degree of public accessibility provide by the DTN and cluster roads in each subunit.

Potential impacts to ancestral/sacred sites in the vicinity the Coyote Spring, Milford, Beryl, Delta, and Ely OB sites appear in Tables 4.4.1-2, 4.4.1-3, 4.4.1-4, 4.4.1-5, and 4.4.1-6, respectively. Short-term effects include a consideration of direct and indirect impact potentials. Due to the paucity of sites precisely located in the archaeological record, estimates of direct impacts are based on the relative proximity of construction activities to areas projected to be highly sensitive. Estimates of indirect short-term impacts are based on the relative proximity of these sensitive areas to the construction camp associated with the OB. The short-term impact rank is an estimate of the combined effects of direct and indirect impact potentials. The long-term impact rank is an estimate of the cumulative effects of construction plus the indirect effects projected during the operations phase and beyond. Key factors in the long-term disturbance are proximity to the OB (particularly within a 50 mi radius) and the degree of public accessibility provided by the DTN and cluster roads in each subunit.

Potential impacts to ancestral/sacred sites associated with the split-basing Alternative 8 (with the primary OB at Coyote Spring) appear in Table 4.4.1-7. Short-term effects include direct impacts during construction due to ground disturbance, and indirect effects within a radius of construction activities. As in Table 4.4.1-1, current information on direct impacts is limited to known sites which occur within a one-mile radius of construction activities, and is therefore incomplete. The indirect impact potential ranks associated with short-term effects are based upon relative proximity to the OB and DDA construction camps. Hydrologic subunits were ranked high if a construction camp is present and/or if the unit contains a construction camp; moderate if a construction camp is located in an immediately adjacent subunit; and low if the subunit is no proximal to the OB or construction camps. The overall short-term impact potential is an estimate based upon the relative proximity of known and predicted site areas to M-X construction areas, and to in-migrant population loci (OBs and construction camps). The long-term impact level is an estimate based upon the cumulative effects of construction plus the indirect effects projected during the operations phase. Key factors in the long-term disturbance are proximity to the Coyote Spring OB and the degree of public accessibility provided by the DTN and cluster roads in each subunit.

It is important to emphasis that assigned impact significance levels are based on incomplete data, are preliminary in nature, and are subject to revision as additional information becomes available.

SOCIOECONOMIC RESOURCES (4.4.2)

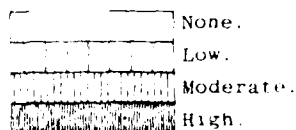
The level of potential M-X impacts on Native American water accessibility and agricultural land use (see Tables 4.4.2-1 and 4.4.2-2) was determined by the

Table 4.4.2-1. Potential impact to Native American water accessibility and land use in the Nevada/Utah DDA for the Proposed Action and alternatives 1-6.

HYDROLOGIC SUBUNIT		NATIVE AMERICAN DEPENDENCE ON WATER RESOURCES ¹	ESTIMATED OVERALL SHORT-TERM IMPACT	ESTIMATED OVERALL LONG-TERM IMPACT ²
NO.	NAME			
Subunits with M-X Clusters and DTN				
4	Snake			
5	Pine			
6	White			
7	Fish Springs			
8	Dugway			
9	Government Creek			
46	Sevier Desert			
46A	Sevier Desert & Dry Lake ²			
54	Wah Wah			
137A	Big Smoky-Tonopah Flat			
139	Kobeh			
140A	Monitor—Northern			
140B	Monitor—Southern			
141	Ralston			
142	Alkali Spring			
148	Cactus Flat			
149	Stone Cabin ²			
151	Antelope			
154	Newark ²			
155A	Little Smoky—Northern			
155C	Little Smoky—Southern			
156	Hot Creek			
170	Penoyer			
171	Coal			
172	Garden			
173A	Railroad—Southern			
173B	Railroad—Northern			
174	Jakes ²			
175	Long			
178B	Butte—South			
179	Steptoe			
180	Cave			
181	Dry Lake ²			
182	Delamar			
183	Lake			
184	Spring			
196	Hamlin			
202	Patterson			
207	White River			
208	Pahroc			
209	Pahranagat			
Other Affected Subunits				
210	Coyote Springs			
219	Muddy River Springs			
Overall DDA Impact				

3837

¹Degree of Native American dependence on the water resource. Also, the level of potential impact on present or future Native American productivity.



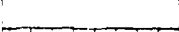
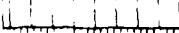


²Conceptual location of Area Support Center. Also.

Table 4.4.2-2. Potential impact to Native American water accessibility and land use in the Coyote Spring operating base suitability area for the Proposed Action and alternatives 1, 2, 4, 6, and 8.

HYDROLOGIC SUBUNIT		NATIVE AMERICAN DEPENDENCE ON WATER RESOURCES ¹	OVERALL SHORT-TERM IMPACT	OVERALL LONG-TERM IMPACT ¹
NO.	NAME			
Subunits within the OB Suitability Area				
210	Coyote Springs			
219	Muddy River Springs			
Other Affected Subunits				
171	Coal			
172	Garden			
174	Jakes ²			
175	Long			
180	Cave			
181	Dry Lake ²			
182	Delamar			
207	White River			
208	Pahroc			
209	Pahranagat			
Overall OB (White River Drainage)				

3838

¹ Degree of Native American dependence on the water resource. Also the level of potential impact on present or future Native American resource use.

	None.
	Low.
	Moderate.
	High.

² Conceptual location of Area Support Center (ASC).

degree of Native American dependence on a water resource and the overlap of M-X water requirements with that resource.

In Table 4.4.2-1 potential M-X impacts are shown for the Nevada/Utah Dedicated Deployment Area (DDA)--where construction of roads and protective structures would actually occur. In Table 4.4.2-2 potential impacts are shown for a possible Operating Base (OB) at Coyote Spring. M-X DDA water requirements (almost all for construction) overlap the water resources of two Native American reservations, the Duckwater Reservation and the Moapa Reservation. Water requirements for a possible OB at Coyote Spring overlap with the water resources of the Moapa Reservation (see sections 4.2.2 and 4.2.4.2).

The degree of Native American dependence on these water resources was judged low if the water resources of a given hydrologic subunit made by a minor contribution to their total needs; moderate if these resources provided a major component of their needs; and high if these resources provided all of their needs.

Potential short-term impacts were judged moderate if the overlap of M-X requirements with Native American water resources was restricted in time and any effect on Native American water resources was dependent on the worst case of exceptionally dry years corresponding to the years of M-X groundwater pumping for construction. Short-term impacts were judged high if any M-X groundwater pumping diminished the availability of groundwater for Native American use.

Potential long-term impacts were judged low if M-X groundwater pumping during the short-term construction years would potentially affect the long-term yield of Native American water sources. Potential long-term impacts were judged high if M-X requirements extended over time (OB requirements) and directly diminished the availability of groundwater for Native American use.

5.0 PROJECTED BASELINE WITHOUT M-X

The persistence of Native Americans as distinct peoples within the larger Nevada/Utah population has at its foundation the maintenance of a cultural and economic base. M-X deployment may affect Native Americans in several ways:

1. Cultural resources, such as habitation sites, sacred areas, burials, and traditional gathering and hunting areas may be directly impacted by project activities or indirectly affected by project-generated public access.
2. Project-generated employment could raise individual and aggregate earnings.
3. Economic opportunity generated by the project could give rise to in-migration to those reservations or colonies distant from economic foci and out-migration from reservations or colonies distant from economic stresses dependent upon the degree of increase or decrease in local Native American populations.
4. Direct effects on Native American grazing and reservation lands are to be avoided, but project activities adjacent to these lands and increased public access to pristine areas could indirectly affect their economic, aesthetic, and cultural value.
5. Direct or indirect diminution of present and potential Native American water resources by project activities would diminish their economic base.

In the absence of M-X, no significant change in the integrity of the Native American cultural resource base or of traditional lifeways is foreseen over the next decade. Culturally significant features, such as ancestral sites, sacred areas, and native flora and fauna, are preserved largely through their isolation from major population centers, large-scale development, and tourist or recreational traffic. The rural areas in which the bulk of cultural resources occur continue to support native species in their natural habitats, are only sparsely populated, and remain generally inaccessible to the public.

The natural growth which is projected for Nevada/Utah in the next decade is not expected to significantly alter the landscape or isolation of rural areas. Planned mining developments, such as Pine Grove Molybdenum (Pine Valley), Alunite (Wah Wah Valley), Anaconda Molybdenum (Big Smoky Valley), and Kennecott (Steptoe Valley), will create only localized ground disturbance and very limited population in-migration. Similarly, proposed power plants, such as the Intermountain Power Project (Lynndyl) and White Pine Power Project and their associated transmission lines, pose a threat to cultural resources only within a limited radius of project facilities. Large-scale commercial and industrial development, such as housing tracts, shopping centers, and industrial parks, will be concentrated on the fringes of major population centers. While disruption of natural ecosystems and some loss of cultural remains through ground disturbance will accompany this growth, the effects will be localized and minimal in terms of the total Native American cultural resource base.

Population in the proposed deployment area will also undergo a process of natural growth in the next decade, and with this growth an expanded need for recreational outlets will occur. As in the case of commercial and industrial development, however, population growth and recreational use will be a gradual rather than a boom phenomenon, and will be most pronounced in the radius of the extant urban centers. Recreation-related loss of cultural resources will remain largely peripheral to these growth effects because the maintenance of relative isolation and inaccessibility.

Without M-X deployment in the Nevada/Utah study area Native American reservations and colonies are expected to continue to experience a gradual process of growth and economic diversification. Reservations can be expected to continue their push for expanded land and water rights--the key to development in the arid region of the Great Basin. The Moapa, Duckwater, and Yomba reservations have all applied for significant land withdrawals. Without M-X, the pool of available land for future grazing rights and reservation additions will remain extensive. Water rights will be available for acquisition along with these lands, and additionally through litigation assisted by the BIA.

Native Americans will continue to utilize plant and animal resources for food, and for raw materials for income-producing crafts. In the absence of M-X deployment, water resources which support native flora and fauna will be preserved and plant and animal resources will remain relatively undisturbed through large-scale development or public accessibility.

There is a growing desire for economic self-sufficiency and independence--especially as evidenced by activities on the Moapa Reservation. Economic development for Native Americans requires time, land, water, manpower, and the maintenance of traditional social relationships and cultural defined morals and values. The Native American quality of life in the region is improving with increased housing, increased cultural awareness, increasing population, and a growing sophistication in dealing with government agencies and in using litigation to achieve their goals. All of these trends would combine to help ensure their social and cultural persistence.

Possible regional development projects such as the proposed White Pine Power Project and the Intermountain Power Project, as well as new mining activities would not significantly affect these Native American trends. These projects would not threaten Native American land or water resources, nor would they be expected to promote Native American migration that might threaten the productivity or persistence of existing reservations and colonies. Construction venues of these projects are sufficiently distant from Native American reservations and colonies so as not to overwhelm existing social relationships or regional population balances.

In the absence of M-X deployment the gradual trend toward social, economic, and cultural stability will continue and can be expected to gather momentum over the next decade. Preliminary data indicate that active programs for increased housing and the expansion of tribal enterprises are underway, and that reservation populations are gradually expanding as members return to take advantage of these improvements.

In conclusion, without M-X Native Americans in the study area will continue their gradual process of growth and economic diversification. They will continue

their efforts for expansion of tribal land and water sources, both of which are necessary for economic survival and future development. Stable social and cultural conditions will provide the opportunity for self-directed growth and the maintenance of Native American traditions and identity.

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APPENDIX A

NATIVE AMERICANS: Ancestral/Sacred Sites and Areas

Consequences Which Are Specific to an
Individual Environmental Variable

1. To what extent will the effect alter the carrying capacity of the environment for the resource?

1	2	3	4	5
no change in carrying capacity		some reduction in carrying capacity		major reduction in carrying capacity

N/A

2. What is the effect of the disturbance on the integrity of the resource?

1	2	3	4	5
no change in viability		some decrease in viability		major decrease in integrity

Due to the long temporal association of Native Americans with the deployment area, ancestral/sacred sites have a broad and relatively dense distribution. It is projected that 80 percent of this cultural resource base will be lost as a result of project deployment. Approximately 35 percent of these sites will be disturbed during construction. The major disturbance will occur from indirect impacts during the life of the project, and beyond. Studies in the California desert indicate a 65-80 percent vandalism rate to such sites following the development of access routes to wilderness areas for recreational activities (i.e., ORV traffic).

3. What is the effect of the disturbance on the quality of the resource?

1	2	3	4	5
no loss in quality		some loss in quality		major loss in quality

Major loss in the quality of the resource will occur in two ways. First, direct impacts will result in the permanent loss of the resource, since these features are non-renewable. Second, indirect impacts associated with population influx will result in vandalism (secondary site loss through pot-hunting), and the defacement or partial disturbance of other sites. Quality from the Native American perspective refers to the extent to which such sites continue to function as a spiritual link to the ancestors, and as a resource for the preservation of traditional cultural systems. Quality from the perspective of the scientific community refers to the ability of the resource base to yield information about past and present cultural systems.

4. To what extent will the effect be masked by normal variation expressed by the resource?

1	2	3	4	5
completely masked		some masking		no masking

N/A

5. To what extent will the effect on the resource be masked by normal resource variability when the influence of potential future projects other than M-X are imposed?

1	2	3	4	5
completely masked		some masking		no masking

N/A

6. How rapidly will the resource recover from the disturbance effect if the effect is temporary?

1	2	3	4	5
rapid recovery		slow recovery		no recovery

N/A

7. How rapidly will the resource recover from the disturbance effect if the effect is permanent?

1	2	3	4	5
rapid recovery		slow recovery		no recovery

There is no recovery rate for ancestral/sacred sites. These resources are irretrievable, and the disturbance irreversible.

8. To what extent will the resource recover from the disturbance effect in a reasonable time period?

1	2	3	4	5
full recovery		moderate recovery		no recovery

N/A

9. To what extent will the resource recover from the effect when this effect is combined with other disturbances expected from M-X (cumulative effects)?

1	2	3	4	5
full recovery		moderate recovery		no recovery

N/A

10. How geographically widespread is the effect of the disturbance on the resource?

1	②	3	4	⑤
localized effect				widespread effect

Direct impacts resulting from ground disturbance will have a generalized local effect (Ranking of 2). The radius of disturbance is expected to average approximately one mile.

Indirect impacts are expected to affect regions far-removed from actual construction sites. The boundaries of this radius cannot be accurately predicted. Important variables include population in-migration and relative accessibility (proximity to new roadways, proximity to new or existing recreational facilities, compatibility of terrain with ORV activities, etc.). A ranking of 5 is appropriate to indirect impacts.

11. To what extent will the effect change the aesthetic value of the resource?

1	2	3	4	5
no change in aesthetic value		moderate decrease in aesthetic value		major decrease in aesthetic value

From the perspective of the Native American community, the proposed action will permanently mar the landscape and will destroy what are, in essence, the icons of their traditional religions. From the perspective of the scientific community and existing environmental laws which protect cultural resources, Disturbance or defacement of ancestral/sacred sites will destroy their cultural integrity, and thereby constitute a visual/aesthetic impact which must be mitigated. As indicated in Question 2 above, approximately 80 percent of the Native American cultural resource base is expected to be lost through direct and indirect impacts associated with the proposed action.

12. What is the scientific or intrinsic value of the resource?

1	2	3	4	5
low scientific or intrinsic value		moderate scientific or intrinsic value		high scientific or intrinsic value

Since very little is currently known about the prehistoric and early historic adaptations of Great Basin Indians, ancestral sites are extremely critical to accurate cultural and evolutionary reconstructions. The present integrity of this cultural resource base is high due to low population density and development in the study area. In addition, the continued use of sacred areas by contemporary Indians provides a critical data base for the development of cultural persistence theories in anthropology.

Issue 1
Competition for Resources

1. How does a change in the effect affect the viability of the resource?

1 2 3 4 5

N/A

2. To what extent will the resource continue to be usable with the same level of quality or capacity for renewal that it previously had?

1	2	3	4	5
no reduction in usefulness to humans		partial reduction in usefulness to humans		major reduction in usefulness to humans

Due to the anticipated 80 percent loss of ancestral/sacred sites over the long-term, a major reduction is projected. For Native Americans, usefulness applies to their access to sacred sites and sacred materials for religious rites (guaranteed under the American Indian Religious Freedom Act) and access to cultural resources for curation and display at tribal museums (probable competition with land management agencies for ownership of artifacts excavated in data recovery programs). Usefulness from a scientific perspective refers to disruption of the integrity of the cultural resource data base. Particularly with reference to indirect impacts, sites lost through vandalism represent an irretrievable loss of information vital to the reconstruction of past human adaptations.

3. What is the extent to which the resource will become limited to the point threatening the carrying capacity of the area or developmental trends which have already been in motion for some historic period of time.

1

2

3

4

5

N/A

Issue 2
Constraint on Future
Development Opportunities

1. Is the change in the effect observable relative to the potential variations in the baseline or trust or other competitors for these development opportunities.

1 2 3 4 5

N/A

2. To what extent does the change in the effect produce a developmental constraint that is observable?

1 2 3 4 5

N/A

3. To what extent does the change in the effect variable degrade the environmental resource which is or would be needed by other competitors?

1	2	3	4	⑤
no constraint on other future uses		moderate constraint on other future uses		major constraint on other future uses

see Issue 1, Question 2

4. To what extent does the change in the environmental variable when combined with competing opportunities cause a considerable stress on some portion of the environment which would not occur if the competition were not there or if constraints were imposed on the developmental directions for the various interested competitors.

1	2	3	4	5
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N/A

5. To what extent is the change in the effect variable a significant modifier of other developmental actions which are planned to take place. For example, will it compete for the same space, will it cause that space to be unusable, will it require stress on limited resources, changes in transportation of goods, etc.?

1

2

3

4

5

N/A

Issue 3
Stress on Growing Communities

1. Is the change in the effect variable large or the same value as established standards for this particular effect?

1 2 3 4 5

N/A

2. Is there a reasonable opportunity for recovery from changes in this effect in a reasonable period of time?

1 2 3 4 5

N/A

3. Will the quality of the area necessarily have to be changed in order to accommodate the changes in these effects?

1 2 3 4 5

N/A

4. Will the change in these effects levels produce a permanent change in some sector of the environment and if so will that change be in total contrast with other induced changes already in process for the future development of the area or will these permanent changes be in concert with other expected changes?

1 2 3 4 5

N/A

5. Will the change in the effect level be significant within the context of the uncertainties of the growth pattern of the impacted regions? That is, if one assumes a 10 percent potential fluctuation in either the compositional structure of the demographics or in the absolute value of the population growth will the changes due to M-X be significantly larger or approximately the same amount of much smaller than this 10 percent absolute change?

1 2 3 4 5

N/A

6. Will growth trends in the area in terms of sectoral composition, population density, urban-rural transitions, and other uses of the land be modified significantly by M-X or will M-X's changes fit within the predicted trends for these areas?

1 2 3 4 5

N/A

7. Will planning for these areas require significant funding specifically for the properties and requirements of M-X or can they be included in umbrella types of funding which would include the future plans of the area and those requirements of M-X which add stress to the growing communities?

1 2 3 4 5

N/A

8. Will M-X require significant additional short-range planning or planning significantly accelerated relative to the planning required for the future development of the area?

1 2 3 4 5

N/A

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9. To what extent will funding be required to mitigate the effect on the resource?

1	2	3	4	5
no funding required to mitigate		moderate funding required to mitigate		major funding required to mitigate

Mitigation for impacts to Native American cultural resources will take three major forms: (1) data recovery, (2) on-site preconstruction survey, and (3) compensation to local tribal communities in the form of the return of artifacts and provision for curation and display. Preconstruction survey and data recovery programs are mandated under federal regulations, and formalized in the cultural resources Programmatic Memorandum of Agreement. The excavation of sites which cannot be avoided is by far the most costly procedure, both in terms of expenditure and construction delays. There is no way at present to estimate the cost of data recovery programs, since the number, size, and type of sites which require this procedure is unknown. In addition to excavation, the Air Force will be financially responsible for storage, processing, and analysis of all recovered artifacts. Finally, curation of artifacts may involve considerable funding for the construction of tribal museums on local reservations, with curation and display facilities which meet the requirements of existing cultural resource laws.

10. To what extent will the effect on the resource have significant economic or social consequences on communities within the study area?

1	2	3	4	5
no significant economic or social consequences				major significant economic or social consequences

The major social consequence of project deployment on Native American communities in terms of cultural resource impacts concerns the viability of traditional religions. The study area composes the Holy Lands of the Shoshone and Southern Paiute peoples. The endangered cultural resources which it contains are the icons of these religious systems, and the spiritual links of contemporary Indians with their ancestors and creator Gods. The projected long-term destruction of these features as a direct or indirect result of deployment will, from the Native American viewpoint, permanently sever the relationship of modern peoples with the "ancient ones," and thereby destroy traditional belief systems and values. Traditionalists believe that spiritual retribution may accompany this process, and that the Indian people themselves may perish.

Issue 4
Preservation of Biophysical and
Cultural Resources

1. What is the legal status of the resources?

1	2	3	4	⑤
no legal status	state protected (game & nongame)	state protected rare or endangered	proposed federally protected	federally protected resources

Native American ancestral/sacred sites are protected by a number of federal laws. These include the National Environmental Policy Act (Section 101(b)(4)) and the Council on Environmental Quality regulations (40CFR1500-1508, Sections 1501.7(a)(1), 1506.6(3)(ii), 1508.8(b), and 1508.14); the National Historic Preservation Act, Executive Order 11593, and 36CFR800-Protection of Historic and Cultural Properties (36CFR800(a)(1) and 36CFR800.15); and the American Indian Religious Freedom Act (Public Law 95-341). Compliance procedures are also outlined in the cultural resources Programmatic Memorandum of Agreement.

2. Will the effect potentially indirectly affect those resources which are legally protected?

1	2	3	4	⑤
minimal likelihood of affecting a legally protected resource		moderate likelihood of affecting a legally protected resource		high likelihood of affecting a legally protected resource

The bulk of long-term or indirect impacts to Native American ancestral/sacred sites is expected to occur during the operations phase of the project, and beyond. The DTN system will open isolated areas to public access on a previously unparalleled scale. Studies in comparable environments, such as the Mohave Desert (Lyneis, Weide, and Warner 1980), indicate that recent public use of the area for recreation has resulted in extremely high vandalism rates to rock art (80%), ancestral habitation sites (74-78%), ceremonial sites or structures (66%), and battlefields (45%). A comparable level of indirect disturbance is predicted for DDA valleys.

3. Will a change in the effect require either behavioral modifications or changes in life patterns in order to preserve the specific cultural resources?

1

②

3

4

5

There is no known way to effectively eliminate or substantially reduce the destruction and vandalism of sites which accompanies increased public recreational use of wilderness areas. This problem relates to the difficulty of monitoring or policing very large areas. Certain measures have been suggested, however, which may result in a degree of behavioral modification. First, an effort may be made to educate the public regarding the importance of cultural resources, and the necessity for preservation of remaining sites. Section I.G of the Programmatic Memorandum of Agreement states: "The Air Force . . . will ensure that its contractors and Air Force personnel and resident dependents are advised against illegal collection of historic and prehistoric materials, will encourage those with interests in such materials to participate in nondestructive activities . . ." A second method may be the creation of restricted areas, such as National Parks, where cultural resources are known to be concentrated in the vicinity of expected population in-migration. The presence of a permanent monitoring staff may help to reduce vandalism and pilfering. Arrow Canyon, for example, which is located close to the Coyote Springs OB site, and which contains many features sacred to the Southern Paiute people and valuable to the scientific community, may be so designated.

4. Will a change in the effect lead to a permanent degradation of some portion of the ecosystem which the cultural resources depends on?

1

2

3

④

5

Secondary ground disturbance associated with population in-migration may create additional indirect impacts to ancestral/sacred sites. ORV activities are linked with the disruption of natural vegetation and the eventual development of serious erosion problems. Erosion results in the washing-out and destruction of surface sites. A second disruption of the ecosystem associated with population influx is increased construction activity and development of commercial, residential, and recreational facilities in previously undisturbed areas.

5. Will a change in the environment effect lead to a degradation of some portion of the ecosystem which contains resources needed for the preservation of a cultural or biological resource?

1

2

③

4

5

Ancestral/sacred resources also include certain plant and animal species which are central to traditional religious rites, and fall under the protection of the American Indian Religious Freedom Act. If water depletion or critical vegetation depletion disrupts the natural habitats of sacred plant or animal species in certain deployment area valleys, this effect may seriously limit access by Native Americans to sacred materials.

6. Will a change in the effect level cause a degradation in the quality or aesthetics of the particular resource that is to be preserved, and will this be a major or a minor change in the aesthetic or quality feature?

1

2

3

4

⑤

no degradation
of quality or
aesthetics

moderate degradation
of quality or
aesthetics

major degradation
of quality or
aesthetics

The destruction or defacement of Native American cultural sites also results in the loss of the spiritual quality of the feature. An element of the traditional cosmology is thereby degraded or removed. Moreover, in traditional belief, disruption of grave sites may result in retaliatory actions by spirits of the dead on living peoples. From the perspective of the scientific community, both the integrity and environmental context of the cultural resource are essential to its quality as a data source. Sites partially or totally disturbed by vandalism become useless for scientific reconstruction of past human adaptations.

General Consequences

1. Are the consequences such that the portion of the resource base will not recover at all?

1	2	3	4	5
no likelihood of irreparable damage to ecosystem		moderate likelihood		certain irreparable damage to resource base

Native American ancestral/sacred sites are non-renewable resources. It is projected that approximately 80 percent of the resource base will be lost through direct and indirect impacts of the undertaking (see above, Consequences Which are Specific to an Individual Environmental Variable, Questions 2, 7, 10; and Issue 4, Question 2).

2. Are the consequences such that the impact may be large, but the recovery processes will overcome the damage in a reasonable period of time?

1	2	3	4	5
full recovery		partial recovery		no recovery

N/A

3. Are the deleterious effects measurable? Variable rankings depending on type of effect:

①	2	③	4	⑤
not measurable		measurable with difficulty		readily measurable

Readily measurable: Direct impacts to sites disturbed and mitigated during construction may be easily inventoried.

Measurable with difficulty: Indirect impacts to known sites outside the areas of direct disturbance may be monitored and measured through longitudinal studies (i.e., a series of surveys over time to record the integrity or disturbance of such sites).

Not measurable: Two types of effects are not measurable. First, indirect impacts to unrecorded sites cannot be inventoried. Since the majority of sites in the study area are not documented, impacts to the larger portion of the total resource base are not directly measurable. Indirect measures may be projected from longitudinal studies on known sites only. A second type of effect, namely the impact of cultural resource loss on the social, cultural, and psychological fabric of Native American communities, cannot be quantified. Longitudinal studies, however, may indicate general trends.

4. Will a change in the effect change the functional relationships existing within the ecosystem and will this cause a change in either the carrying capacity or other characteristics of viability associated with the system?

1	2	3	4	5
no change in functional relationships		moderate change in relationships		major change in relationships

N/A

5. Do these deleterious effects or consequences result in degradation of other measurable environmental variables?

1

2

3

4

5

N/A

6. Although the environmental effect itself may not be significant within the framework of the first five criteria, will it when measured in conjunction with certain other critical environmental variables produce changes that are observable within the framework of the criteria of the five standards?

1

2

3

4

5

N/A

Significance Analysis of the Native American Resource Water Accessibility and Agricultural Land.

2. What is the effect of the disturbance on the integrity of the resource?

1	2	3	④	5
no change		some decrease		major decrease

Water use, in the Nevada/Utah DDA and Coyote Springs OB site during construction and operation could significantly reduce the water and land use value of the Duckwater and Moapa Reservations holdings. Construction demands in Railroad North and South Valleys, and Little Smokey North and South Valleys (adjacent to Duckwater holdings) total 12,600 acre feet. (Table Pubs #2394.) Although water resources in Railroad Valley are probably sufficient to accomodate the 8,400 acre feet required there (State of Nevada Department of Reference Conservation and Natural Resource Water Resources - Water Reconnaissance Series Report 60), springs and wells on the Duckwater Reservation and its BLM permit grazing lands could be affected by local localized draw down, as could native pherophenic vegetation. Irrigation and stock watering could be at risk, for at least the short term. The Moapa reservation is dependent on groundwater flowing from the White River drainage system, discharging at Muddy River Springs. The annual discharge is 36,000 acre ft. of which fully 24% is issued on the Moapa Reservation (6.8 times state allotments (Eakins 1964, Facilitations Inc., 1980) construction water demands upstream could have extremely significant negative impact on the outflow of the Muddy River Springs - especially if that water use period corresponds with series of relatively dry years (Eakin 1966). Operation of an OB at Coyote Springs would require 4,000 acre feet annually over a 30 year period (Source: Table dealing with OB operations requirements). A withdrawal that would be reflected in a similar reduction in flow at the Muddy River Springs. For the perrenial yield of the lower White River drainage is the same as the discharge of the Muddy River Springs.

4. To what extent will the effect be masked by normal variation expressed by the resource?

1	2	3	4	⑤
masked		some masking		completely masked

Although some variation exists in Spring flows on Duckwater Reservation grazing lands, Native American's water resources are remarkably constant. Warm Springs at the Duckwater Reservation and the Muddy River Springs - the source of Moapa Reservation supplies - essentially have no variation in flow ((Eakin 1964:23, State of Nevada), Department of Conservation and Natural Resource, Groundwater Resources - Reconnaissance Series Report #25 and #60).

6. How rapidly will the resource recover from the disturbance effect if the effect is temporary?

①	2	3	4	5
rapid recovery		slow		no recovery

7. How rapidly will the resource recover from the disturbance effect if the effect is permanent?

1	2	3	4	⑤
rapid recovery		slow		no recovery

Assuming no permanent damage is done to the structure supplying Duckwater Reservation springs and wells by excessive draw down, recovery should be relatively quick (on the order of weeks or months). Excessive pumping for construction use in the White River Basin, that corresponds to a series of dry years, could have long term effects - not immediately felt - on the flow of the Muddy River Springs. OB pumping immediately upstream of the springs would diminish their flow for the life of the base.

12. What is the scientific or intrinsic value of the resource?

1	2	3	4	⑤
low		moderate		high

Native Americans in Nevada/Utah are economically depressed. Water is absolutely essential to bring land into production and provide a viable economic base. Future economic development is also dependent on adequate water supplies. Both to Duckwater and Moapa Reservations have plans to develop reservation expansions. Water accessibility has been identified by them as being a non-compensable resource.

3. What is the extent to which the resource will become limited to the point of threatening the carrying capacity of the area or developmental trends which have already been in motion for some historic period of time.

1	2	③	4	5
no limitations		limited		very limited

Water demands for construction in valleys surrounding the Duckwater Reservation will not threaten the carrying capacity of Duckwater Reservation land holdings unless permanent damage is done to the structure of springs and wells by excessive localized pumping. In the short term, during construction, existing stock watering sources and irrigation waters might be reduced to the point of a temporary reduction in productivity, again assuming excessive localized pumping for construction use access.

Reduction in water flow at Muddy River Springs, especially by OB operations at Coyote Springs, might jepordize present water demands at the Moapa Reservation (which are in 6-8 times excessive of Nevada State decrees) reducing the value of their cattle and horticultural operations. Such a reduction would limit development of the proposed 70,000 acre Moapa Reservation expansion which would be junior to the demands of other Muddy River water users for excess water.

5. To what extent is the change in the effect variable a significant modifier of

other development actions which are planned to take place. For example, will it compete for the same space, will it cause that space to be unusable, will it stress limited resources, changes in transportation of goods, etc.?

1 2 ③ 4 5

no constraint constraint high constraint

Reduction in the flow of the Muddy River Springs would hinder Moapa Reservation development plans on the existing reservation (expansion of intensive horticulture) and on the proposed 70,000 acre expansion.

10. To what extent will the effect on the resource have significant economic or social consequences on communities within the study area?

1 2 3 4 ⑤

no consequences major consequences

Temporary or permanent decrease in water supplies and therefore land use values on the Duckwater Reservation holdings would limit economic potential among an already poor people. Such economic decline could effect the integrity of the Duckwater as a distinct people.

Similarly, among the Moapa an economic decline as a decrease in the rate of economic growth would have negative effects on the persistence of the Moapa as a distinct people. The Moapa have stresses economic self-sufficiency and independence as the guiding principle of the reservation. Considerable economic growth has occurred and is planned - especially with the proposed 76,000 acre expansion - and a decrease in this growth or a retrenchment of these plans would stress the growing Moapa Reservation community.

1. Are the consequences such that the portion of the ecosystem or society will not recover at all?

1 2 3 ④ 5

no likelihood of damage certain irreparable damage

The Duckwater Reservation has the capacity to recover from any temporary stress on its water resources. Although its growing population requires ever more waters and land to meet basic economic needs as well as future aspirations.

The Moapa could be extremely limited in their economic potential if an OB site at Coyote Springs reduced the flow of the Muddy River Springs. Given the growing population at the Moapa Reservation and their growing aspirations limits on their economic opportunities could be disastrous for their continuity as a distinct people.

3. Are the deleterious effects measurable?

1 2 ③ 4 5

not measurable
measurable

measurable
with difficulty

readily
measurable

Given adequate economic and socio-cultural baseline data the effects of water accessibility limits on Native Americans could be measured.

Significance Analysis of Native American Migration

4. To what extent will the effect be masked by normal variation expressed by the resource?

1 2 ③ 4 5

masked some masking no masking

Historically, Native Americans within the Great Basin were highly mobile making the rounds of accessible resources. Today, this tradition of mobility persists with movement for education, jobs, and visiting kin. Hard data are lacking on the actual amount and extent of migration for these purposes. There are four factors which support this finding in the absence of more detailed studies. (1) Population of enrolled members on reservations appears to grow with increased housing and economic opportunity (e.g., the Moapa Reservation). (2) A significant proportion of enrolled members live off reservation (e.g., Skull Valley Reservation: 87 members but only three families in residence; Goshute Reservation: 602 members, three families on the Reservation; Fallon Reservation and Colony: 669 members, 529 in residence. (3) High rates of unemployment and underemployment (as measured by per capita income \$1,500) is the rule among Great Basin Native Americans. (4) Native Americans freely living with relatives all over the Great Basin for the purposes of employment, education, or just visiting.

5. To what extent will the effect on the resource be masked by normal resource variability when the influence of potential future projects other than M-X are imposed?

1 2 ③ 4 5

masked some masking no masking

In the absence of hard data on the migration levels among Native Americans in the Great Basin and a model which predicts their movements toward new economic foci it can only be assumed that future projects would accelerate rates of migration already accelerated by the economic opportunities provided by M-X.

10. How geographically widespread is the effect of the disturbance on the resource?

1 2 3 4 ⑤

localized effect widespread effect

Native Americans from all over the Great Basin are expected to move toward new economic foci. Those reservations and colonies situated near centers of M-X generated economic activities would be the recipients of the bulk of these migrants. The effects would be felt as a loss of population in distant reservations and colonies and a gain in population at central ones. Most at risk as a central receiving venue is the Duckwater Reservation, followed by the Ely Colony and Moapa Reservation.

2. To what extent does the change in the effect produce a developmental constraint

1	2	3	4	(5)
low				high

3. To what extent does the change in the effect variable degrade the environmental resource which is or would be needed by other competitors?

Labor force in-migration would stress local resources on centralized reservations and colonies and these in-migrations would compete with local residents for existing as well as M-X generated employment.

1 2 ③ 4 5

short time long time

1 2 3 ④ 5

none required **major funding**

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10. To what extent will the effect on the resource have significant economic or social consequences on communities within the study area?

1	2	3	4	5
no consequences				major consequences

Labor migration within the Great Basin would stress both supplying and receiving reservations. In receiving reservations competition for jobs, crowding in housing and schools, and dilution of other available services would occur. Existing social relationships would be modified in reservations either supplying or receiving migrants. In receiving reservations a large influx of migrants could lead to an increase in antisocial behavior and intrareservation hostility.

1. Are the consequences such that the portion of the ecosystem or society will not recover at all?

1	2	3	4	5
no likelihood		moderate likelihood		certain irreparable damage

Massive Native American migrations following the M-X construction boom and bust would probably effect permanent changes in the Native American communities at risk. In the absence of hard data on migration and other socioeconomic variables, it is impossible to precisely judge either the nature of potential damage or its possible extent.

3. Are the deleterious effects measurable?

1	2	3	4	5
not measurable		measurable with difficulty		readily measurable

If adequate baseline data on migration are collected, then the extent of migration, its causes and its effects can be monitored and the consequences perhaps mitigated.

5. Do these deleterious effects or consequence result in degradation of other measurable environmental variables?

1	2	3	4	5
no				yes

Native American community infrastructure and services will be considerably stressed under heavy in-migration. Reservation experiencing out-migration during construction on following the end of construction would experience a decline in economic growth, and perhaps an absolute decline in their economic base. More detailed data are required to make more precise predictions.

